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# REPORTS

OF THE

# INSPECTORS OF MINES

OF THE

## ANTHRACITE COAL REGIONS OF PENNSYLVANIA,

FOR THE

## YEAR 1879.

HARRISBURG:
LANE S. HART, STATE PRINTER.
1880.

VIRTUE
LIBERTY AND
INDEPENDENCE

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# REPORTS

OF THE

# INSPECTORS OF MINES

OF THE

# ANTHRACITE COAL REGIONS OF PENNSYLVANIA,

FOR THE YEAR 1879.

## FIRST OR POTTSVILLE DISTRICT.

POTTSVILLE, SCHUYLKILL COUNTY, PA., *March, 1880.*

To His Excellency HENRY M. HOYT,
*Governor of Pennsylvania:*

SIR: I have the honor of herewith submitting the following report of the office of clerk of the mining district of Schuylkill for the year 1879, together with consolidated and comparative tables of the production of coal, number of employés, and casualties for the entire district, which are given in detail by the inspectors in their several reports hereto attached.

In March the court of Schuylkill county made an order that the clerk of this mining district should receive, classify, and make monthly reports to said court of all matters required by the ventilation act of 1870, and such other information as would be of interest or benefit to the district.

In accordance with this order, blanks were prepared and distributed by the inspectors to the several collieries in their respective districts, and in May the first report was submitted to the court, and continued regularly each month thereafter.

The May report was exceedingly meager and unsatisfactory, owing to the great difficulty experienced by the inspectors in obtaining the necessary data from the several collieries within their respective districts. Through diligent and constant exertions, they have, in a great measure, overcome the objections or neglect of operators and superintendents in making returns, and now receive, with some few exceptions, complete and satisfactory returns from all the collieries. Prompt, accurate, and complete returns of filled-in blanks sent out by the inspectors to collieries monthly, as required, would be of immeasurable benefit, not only to those in the trade, but to the general public, as giving an officially accurate statement of the amount of coal produced, the number of employés engaged in and about the mines, the general condition of collieries as to health and safety, the improvements made, and the casualties for the month, with such remarks and suggestions as were applicable, which, by their publicity, would have a tendency to lessen the number of accidents, particularly those caused by carelessness, ignorance, or neglect. We hope during the present year to present each month accurate and complete statistics of the entire production of coal in this district. That those interested, having seen the benefits to be derived by their publication, will cheerfully assist in making them such by the prompt filling in and return of the blanks furnished, is earnestly to be hoped for.

| | |
|---|---|
| Total amount of coal mined in First or Pottsville division, | 1,855,164.00 |
| Total amount of coal mined in Second or Shenandoah division, | 4,386,969.00 |
| Total amount of coal mined in Third or Shamokin division, | 3,816,122.16 |
| Total tons mined in entire district, | 10,058,255.16 |

| | |
|---|---|
| Total number of employés in First or Pottsville division, | 6,242 |
| Total number of employés in Second or Shenandoah division, | 11,080 |
| Total number of employés in Third or Shamokin division, | 11,094 |
| Total number in entire district, | 28,416 |

| | | |
|---|---|---|
| Total number of fatal accidents in Pottsville division, | | 24 |
| Total number of non-fatal accidents in Pottsville division, | 158 | |
| Total number of fatal accidents in Shenandoah division, | | 43 |
| Total number of non-fatal accidents in Shenandoah division, | 116 | |
| Total number of fatal accidents in Shamokin division, | | 46 |
| Total number of non-fatal accidents in Shamokin division, | 103 | |
| | 377 | 113 |
| Total casualties, | | 490 |

| | |
|---|---|
| Total number of tons mined per life lost, | 89,010.04 |
| Total number of tons mined per person injured, | 26,679.17 |
| Ratio of employés to each life lost, | 251½ |
| Ratio of employés to each person injured, | 75½ |
| Total number of tons of coal, fire-clay, iron stone, and shale mined in Great Britain and Ireland in 1878, | 145,798,138 |
| Of which there was tons of coal, | 132,612,063 |
| Total number of employés, | 475,329 |
| Total number of accidents, | 811 |
| Total number of deaths from above accidents, | 1,413 |
| Number of tons of mineral mined to each life lost, | 103,183.07 |
| Number employés to each life lost, | 336⅓ |

Non-fatal casualties are not given in the English report.

**Classification of Fatal Accidents.**

| | Schuylkill. | England. |
|---|---|---|
| Explosions of fire damp, | 12 | 586 |
| Falls in mines, | 56 | 469 |
| Miscellaneous underground, | 30 | 272 |
| Miscellaneous surface, | 15 | 86 |
| | 113 | 1,413 |

| | |
|---|---|
| Ratio of fatal accidents to total employés in mining district of Schuylkill, | 251½ |
| Ratio of fatal accidents to total employés in Great Britain and Ireland, | 336⅓ |

The English mines report is taken for comparison, being the latest received.

Very respectfully,
EDWARD J. GAYNOR,
*Clerk.*

**Schuylkill Basis Wages.**

The wages of mine employés in Schuylkill, Northumberland, and Columbia counties are calculated each month on the price of coal, above or below a basis price of $2 50 per ton at Port Carbon, five collieries being drawn monthly to give average price of sales.

The Philadelphia and Reading Coal and Iron Company regulate wages by the price of coal at Schuylkill Haven, with minimums governed by the rate of tolls and freights on the railroad, from Schuylkill Haven to Philadelphia.

| | |
|---|---|
| Engineers, per month, | $60 00 |
| Firemen, per week, | 9 50 |
| Blacksmiths, per week, | 11 00 |
| Carpenters, per week, | $9 to 12 00 |

| | |
|---|---|
| Outside men, per week, | 9 00 |
| Platform men, per week, | $9 to 10 00 |
| Dump chute men, per week, | 8 00 |
| Dirt bank men, per week, | 9 00 |
| Car loaders, per week, | $11 to 13 00 |
| Slate pickers, (boys,) per week, | 2 50 |
| Slate picker boss, per week, | 9 00 |
| Starters, (inside,) per week, | 10 50 |
| Loaders, per week, | 10 00 |
| Miners, per week, | $11 70 to 15 00 |
| Drivers, per week, | 10 00 |
| Contract price per yard for driving gangway, | $5 50 to 11 00 |
| Contract price per yard for driving tunnels, | 20 00 to 50 00 |
| Contract price per wagon for cutting coal, | 50 cents to 1 25 |

The average price of coal for each month during year 1879, as given by Schuylkill Coal Exchange, with per centage below the basis; also minimum basis as regulated by freight and tolls, as per order of F. B. Gowen, President of the Philadelphia and Reading Coal and Iron Company, including averages of auction sales of Delaware, Lackawanna and Western Railroad Company, f. o. b., at Hoboken:

| MONTHS—1879. | Average price of coal, per Schuylkill Exchange. | Per centage off basis, per Schuylkill Exchange. | Per centage off basis, per Philadelphia and Reading Coal and Iron Company. | Average price of coal at New York auction sales. |
|---|---|---|---|---|
| January, | $1 76 6/10 | 24 | 20 | $2 43 |
| February, | 1 77 | 24 | 20 | 2 37 3/8 |
| March, | 1 73 2/10 | 25 | 20 | 2 28 1/4 |
| April, | 1 66 | 28 | 20 | 2 17 |
| May, | 1 66 | 28 | 20 | 2 19 3/8 |
| June, | 1 68 | 27 | 16 | 2 33 3/8 |
| July, | 1 65 | 28 | 16 | 2 51 3/4 |
| August, | 1 66 35/100 | 28 | 12 | 2 19 1/4 |
| September, | 1 69 67/100 | 27 | 12 | 2 16 1/16 |
| October, | 1 79 | 24 | 12 | No sales. |
| November, | 2 05 | 15 | 8 | " |
| December, | 1 93 6/10 | 19 | 8 | " |
| Total average, | $1 75 5/10 | 24 3/4 | 15 1/3 | $2 29 7/16 |

Office of Inspector of Mines,
Pottsville, Pa., *March 15, 1880.*

To His Excellency Henry M. Hoyt,
*Governor of Pennsylvania:*

Sir: I have the honor of herewith submitting my annual report for the year 1879, containing list of casualties in detail, the number of employés, classified, and number of tons of coal mined by each colliery, together with a comparative table of tonnage for four years.

There were twenty-four lives lost, and one hundred and fifty-eight persons injured during the year, an increase of ten lives lost, and one hundred and twenty-two injured, over that of 1878.

| | |
|---|---|
| The amount of tons of coal shipped to market was, . . . . | 1,773,612.08 |
| Estimated amount sold or used at collieries, . . . . . | 81,551.12 |
| Total for year, . . . . . | 1,855,164.00 |
| An increase over that of 1878, of . . . . . | 544,531.05 |

(Amount sold or used at collieries was not added in 1878.)

The collieries of the district are all in condition to increase their production over that of the past year.

Very respectfully,
SAMPSON PARTON,
*Inspector*,
Per E. J. Gaynor.

| DATE. | Names of persons injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| Jan. 11 | Henry S. Davis, . . | Laborer, . . . . . | Wadesville, . . . . . | Fall of coal; hand crushed. |
| 17 | Alexander Trier, . . | Breaker fireman, | Pyne, . . . . . | Fell about twelve feet, striking his head upon railroad spike; skull fractured. |
| 17 | Owen Roundtree, . | Miner, . . . . . | Otto, . . . . . | Fall of clod; back and shoulders cut. |
| 22 | John Proppert, . . | do. . . . . | Pine Forest, . . . . . | Fall of coal from slip; head cut, leg bruised. |
| 25 | William James, . . | do. . . . . | Thomaston, . . . . . | Knocked down chute by coal; hip injured. |
| 29 | Sol. Schreffler, . | Plane runner, . . | do. . . . . | Arm caught between front of wagon and side hook, while pushing wagon over top of plane. |
| 31 | John McGurk, . . . | Laborer, . . . . . | Pottsville, . . . . . | Hand caught between wagon and cage; one finger cut off, and others severely injured. |
| Feb. 1 | Bernard McGovern, | Miner, . . . . . | Otto, . . . . . | Coal flying from pick; eye injured. |
| 4 | William Carlin, . . | Laborer, . . . . . | Eagle Hill, . . . . . | Jammed between wagon and rock; breast bruised. |
| 5 | Martin Donavan, . | Miner, . . . . . | Pine Forest, . . . . . | Fall of clod; head and body bruised. |
| 5 | John J. Davis, . . | do. . . . . | Glendower, . . . . . | Coal slipped from face of breast; leg broken. |
| 8 | Thomas Eckles, . . | Driver, . . . . . | Richardson, . . . . . | Putting in chute board; tip of finger cut off. |
| 20 | Michael Dunn, . . | Miner, . . . . . | Thomaston, . . . . . | Fall of slate in gangway; collar bone broken. |
| 21 | Ed. McCaffrey, . . | Loader, . . . . . | Otto, . . . . . | Coupling mine wagons; hips bruised. |
| 22 | Owen Roundtree, . | Miner, . . . . . | do. . . . . | Fall of coal, robbing pillars; left side bruised. |
| 22 | George Dalton, . . . | do. . . . . | Pine Forest, . . . . . | Fall of coal from breast; head cut, back and legs bruised. |
| 25 | Jas. Haughney, jr., | do. . . . . | Beechwood, . . . . . | Fall of coal; head severely bruised. |
| Mar. 1 | John Simmendinger | do. . . . . | Rausch Creek, . . . . . | Explosion of gas, Cutting hole from inside to outside chute, |
| 1 | Chas. Simmendinger | do. . . . . | do. . . . . | do. do. when small hole was opened through, lamp fell, and ignited gas. |
| 1 | William O'Neill, . . | Door boy, . . . . | Thomaston, . . . . . | Caught between mine wagons; knee injured. |
| 3 | J. Brennan, (Rush,) | Miner, . . . . . | Richardson, . . . . . | Fall of coal; back hurt. |
| 8 | Peter Flanigan, | Laborer, . . . . . | Pine Forest, . . . . . | Rolling stick of timber; leg broken. |
| 11 | Jas. Purcell, senior, | Miner, . . . . . | Beachwood, . . . . . | Fall of coal from roof; foot injured. |
| 12 | Thos. R. Brennan, . | Top man, . . . . | Richardson, . . . . . | Lifting mine wagon; back sprained. |
| 13 | Charles Long, . . . | Loader, . . . . . | Colket, . . . . . | Hand caught between break pole and prop; finger mashed. |
| 14 | John Gorman, . . . | Miner, . . . . . | Eagle Hill, . . . . . | Carrying prop up chute; hand jammed against lump of coal. |
| 19 | John Bows, . . . . | Tunnel man, . . . | Pottsville, . . . . . | Explosion of dynamite powder. |
| 20 | Con. Kelly, . . . . | Miner, . . . . . | Thomaston, . . . . . | Explosion of gas, opening new breast; hand burned. |
| 22 | Matthew Diehl, . . | Bottom man, . . . | do. . . . . | Lump of coal rolling back from slope; ankle bone broken. |
| 27 | Martin Brophy, . | Miner, . . . . . | Richardson, . . . . . | Fall of coal; foot severely bruised. |
| 27 | Edmund Edmonds, | do. . . . . | Thomaston, . . . . . | Spike flew while driving, and struck him in the eye. |

| | | | | |
|---|---|---|---|---|
| 28 | Michael Fox, . . . | do. . . . . | Pine Forest, . . . . . | Explosion of gas from feeder; burned slightly. |
| Apr. 3 | John Gleason, . . . | Rockman, . . . . | Richardson, . . . . . | Fall of piece of slate; fingers crushed. |
| 8 | James Carney, . . . | Miner, . . . . . | Wadesville, . . . . . | Fall of top coal; head cut. |
| 9 | Moses James, . . . | Bottom spragger, | Glendower, . . . . . | Ring of spreader chain broke on slope, a portion of which struck him at bottom of slope; leg broken. |
| 9 | William Oram, . . | Laborer, . . . . . | do. . . . . | |
| 11 | James John, . . . | Miner, . . . . . | Pine Forest, . . . . . | Fall of clod; back injured. |
| 17 | Thomas Thomas, . . | do. . . . . | Otto, . . . . . | Explosion of gas; |
| 17 | Robert Graham, . . | do. . . . . | do. . . . . | do. do. |
| 17 | David Adamson, . . | do. . . . . | do. . . . . | do. do. |
| 17 | John Monoghan, . . | do. . . . . | do. . . . . | do. do. |
| 17 | Thomas Conway, . | do. . . . . | do. . . . . | do. do. |
| 17 | Thomas Larkin, . . | do. . . . . | do. . . . . | do. do. |
| 17 | Thomas Mealey, . | do. . . . . | do. . . . . | do. do. |
| | | | | } none burned seriously. |
| 21 | James W. Brennan, | Starter, . . . . . | Glendower, . . . . . | Battery started while drilling hole; hips injured. |
| 21 | Edward McQuillam, | do. . . . . | Pyne, . . . . . | Loading wagon, had door raised, the fastening of which got loose, letting door fall, injuring his head. |
| 23 | Nicholas Moran, . | Miner, . . . . . | Beechwood, . . . . . | Explosion of gas in small heading; severely burned. |
| 23 | Joseph Schmidt, . . | do. . . . . | Pine Forest, . . . . . | do. do do do. |
| 26 | Michael Quinn, . . | do. . . . . | Thomaston, . . . . . | Explosion of gas, coal running out from face of breast, checked current of air; face and hands burned. |
| 29 | John Fowler, . . . | Driver, . . . . . | Mine Hill Gap, . . . . . | Kicked by mule; hip injured. |
| May 2 | Daniel Richards, . . | do. . . . . | Pyne, . . . . . | Finger caught between hook of wagon, and spreader hook; top cut off. |
| 7 | John Ryan, No. 1, | Miner, . . . . . | Eagle Hill Shaft, . . . . . | Fall of top coal; arm broken, and head severely cut. |
| 7 | James Devlin, No. 1, | do. . . . . | do. . . . . | Fall of top coal, trying to avoid fall, jumped down chute, cutting his head. |
| 8 | James Brady, . . . | do. . . . . | Otto, . . . . . | Explosion of gas, barring down coal in chute, coal carried gas down on naked light; face burned slightly. |
| 9 | John Gallagher, . . | do. . . . . | Richardson, . . . . . | Explosion of gas; face and hands burned. |
| 10 | Patrick Purcell, . . | do. . . . . | do. . . . . | Coal flying from shot; one finger taken off, and one mashed. |
| 14 | Moses Parkin, . . . | do. . . . . | Wadesville, . . . . . | Raising buggy; it fell on his hand, crushing it. |
| 15 | Benjamin Brace, . . | do. . . . . | Mine Hill Gap, . . . . . | Struck by piece of coal; leg broken. |
| 26 | Mark Lyons, . . | Blacksmith, . . | do. . . . . | Breaking connection of steam pipe; arm scalded. |
| 24 | Wm. Cookson, jr., . | Driver, . . . . . | Beechwood, . . . . . | Jammed between mule and prop; rib fractured. |
| 27 | John Ploppert, . . | Miner, . . . . . | Pine Forest, . . . . . | Fall of coal; leg, head, and body injured. |
| 29 | James Redington, | do. . . . . | Beechwood, . . . . . | Fall of coal from roof; back severely cut. |
| 31 | Matthew Kelly, . . | Driver, . . . . . | Thomaston, . . . . . | Arm caught between wagon and collar; wrist out of joint. |
| June 2 | Evan J. Thomas, . . | Miner, . . . . . | Wadesville, . . . . . | Fall of top coal; side and leg bruised. |
| 4 | Patrick McGovern, | do. . . . . | Otto, . . . . . | Piece of rock struck ball of eye. |
| 15 | Daniel Murray, . . | do. . . . . | Eagle Hill Shaft, . . . . . | Premature explosion of blast; foot and ankle injured. |
| 17 | Michael Conners, . | Driver, . . . . . | Wadesville, . . . . . | Fall of slate; leg probably broken. |
| 20 | Richard Tierney, . . | Miner, . . . . . | Colket . . . . . | Premature blast, back, head, and face injured. |
| 23 | William O'Brien, . | do. . . . . | Richardson, . . . . . | Fall of coal; ribs fractured. |

REGISTER OF CASUALTIES—Continued.

| DATE. | Names of persons injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| June25 | Joseph Diff, | Loader, | Thomaston, | Fingers cut off. |
| 25 | George Morgan, | Miner, | do. | Fell down man-way; back hurt. |
| 28 | Richard Procta, | do. | Phœnix Park, No. 2, | Premature blast; face cut, and otherwise bruised. |
| July 1 | William Brennan, | do. | Beechwood, | Fall of coal; foot severely injured. |
| 7 | James McMichael, | Slate picker, | Lehigh, No. 8, | Caught by belt in breaker, stepped over it instead of going around it, was thrown about ten feet; leg broken. |
| 8 | Valentine Kline, | Miner, | Pine Forest, | Fall of top coal: large cut on back. |
| 9 | Jerry Fitzgerald, | Driver, | Wadesville, | Coupling wagons; small bone of arm broken. |
| 10 | John Hagan, | Loader, | do. | Collar fell; shoulder bone cracked and injured. |
| 17 | Tim O'Herron, | Miner, | Eagle Hill Shaft, | Match of blast too short, and exploded before he reached heading, injuring back. |
| 18 | Jas. O'Donnel, No. 1, | do. | Pottsville, | Explosion of gas; hands and neck slightly burned. |
| 19 | Joseph Schuster, | Laborer, | Pine Forest, | Side of air-shaft caved in while timbering it, breaking down the platform, and precipitating them to bottom; all severely injured. |
| 19 | John Maguire, | Inside boss, | do. | |
| 19 | James McDonald, | Miner, | do. | |
| 19 | John Kline, | do. | do. | Premature blast; severely injured. |
| 21 | John Thomas, | Door boy, | Otto, | Driving team in mine; head caught between chute and wagon, and severely injured. |
| 21 | Michael Sulley, | Miner, | do. | Slipped coming down manway; ankle sprained. |
| 23 | George Thomas, | Starter, | Mine Hill Gap, | Struck by piece of rock; leg broken. |
| 28 | James Scully, | Driver, | do. | Kicked by mule; face injured. |
| 29 | Thomas Hodgson, | Fan boy, | Pine Forest, | Finger crushed between cog-wheels of fan. |
| 31 | Edward Lipsell, | Coupler, | Thomaston, | Kicked by mule; elbow and arm injured. |
| 31 | Isaac Garland, | Miner, | Glendower, | Lifting timber; ruptured. |
| Aug. 1 | Joseph Seigle, | do. | Colket, | Dressing-off top coal after shot; piece fell, breaking leg. |
| 2 | Thomas Woodward, | Loader, | Mine Hill Gap, | Jammed between wagons; shoulder blade broken. |
| 8 | Edward Herbert, | Inside boss, | Pottsville, | Explosion of sulphur in leader of tunnel; hand and face severely burnt. |
| 8 | Hugh Murray, | Contractor, | do. | |
| 8 | George Schum, | Laborer, | do. | Explosion of sulphur in leader; slightly burnt. |
| 8 | James Hall, | do. | do. | |
| 9 | David Davis, | Miner, | Beechwood, | Fall of coal; severe cut on back. |
| 13 | Benjamin Gettens, | do. | Pine Forest, | Dressing coal after shot; hand severely cut. |
| 13 | Hugh Thomas, | do. | do. | Raking coal, piece of loose coal ran down chute; injuring both legs. |
| 14 | James Head, | do. | Wadesville, | Fall of top coal; head cut. |
| 16 | John Maul, | Inside carpenter, | Otto, | Hand caught by pump rod; flesh stripped from finger. |

| | | | | |
|---|---|---|---|---|
| 25 | Thomas Mulroy. . . | Miner, . . . . . | Wadesville, . . . . . | Fall of top coal; head and face cut. |
| 29 | John Bailey, . . . . | Loader, . . . . . | Beechwood, . . . . . | Kicked by mule; testicles injured. |
| Sept. 3 | James Landers, . . | Miner, . . . . . | do. . . . . | Fall of coal; finger broken. |
| 3 | Elijah Smith, . . . | do. . . . . | Pottsville, . . . . . | Fell from scaffold; badly bruised about hips and body. |
| 5 | Thomas James, . . | do. . . . . | Thomaston, . . . . . | Explosion of gas, starting chute; face and hands burned. |
| 6 | John McGuire, . . | do. . . . . | Phœnix Park, No. 3, . . . . . | Riding up slope; head caught by air box; neck and back injured. |
| 9 | William Murray, . | do. . . . . | Eagle Hill Shaft, . . . . . | Fall of top slate; leg broken at ankle. |
| 9 | Martin O'Brien, . . | do. . . . . | Otto, . . . . . | Fell from chute platform; striking side hook on wagon. |
| 10 | Edward Larkin, . . | Top man, . . . . | Richardson, . . . . . | Struck by piece of timber and thrown against cage; eye and side injured. |
| 12 | Nicholas Schichtle, . | Miner, . . . . . | Pine Forest, . . . . . | Explosion of gas. |
| 15 | Condy Cunningham, | do. . . . . | Lehigh, No. 8, . . . . . | Explosion of gas. |
| 15 | James Furrey. . . | do. . . . . | do. . . . . | |
| 30 | Charles Donnelly, . | do. . . . . | Phœnix Park, No. 3, . . . . . | Explosion of blast, squibs too short; arm and head cut. |
| Oct. 2 | Samuel Richards, . | do. . . . . | Thomaston, . . . . . | Explosion of gas, working with naked light, in opposition to rules. |
| 2 | Andrew Crawford, . | do. . . . . | do. . . . . | |
| 2 | Patrick Gannon, . . | do. . . . . | do. . . . . | |
| 8 | Alex. McDonald, . | do. . . . . | East Franklin, . . . . . | Explosion of blast, squib too short; hand and face cut. |
| 11 | Michael Gavin, . . | Bottom man, . . | Thomaston, . . . . . | Struck by spreader chain; head and back injured. |
| 13 | Thomas Williams, . | Miner, . . . . . | Pottsville, . . . . . | Fall of slate; head and back bruised. |
| 15 | Hamilton Dull, . . | Driver, . . . . . | East Franklin, . . . . . | Coupling cars; hand mashed. |
| 22 | Isaac Morris, . . . . | Switch boy, . . . | Kalmia, . . . . . | Caught his foot at switch, and fell under locomotive, the feed pipe of which pushed him forward, and prevented his getting under wheels; severely injured. |
| 23 | John Thomas, . . . | Miner, . . . . . | Thomaston, . . . . . | Fall of top coal; side and back severely injured. |
| 24 | Charles Bauer, . . . | Contractor, . . . | Kalmia, . . . . . | Explosion of blast; squib burned slow, supposing it had missed returned to relight it, when it went off. |
| 25 | Michael Buehler, . | Miner, . . . . . | Sharpe Mountain, . . . . . | Sinking air-hole from surface; in coming out slipped, falling down about twelve feet; leg broken. |
| 27 | Henry F. Hand, . . | Driver, . . . . . | Kalmia, . . . . . | Mule, in starting trip, fell upon him; leg broken. |
| 27 | Walter Whitehair, . | Miner, . . . . . | Greenwood, No. 2, . . . . . | Explosion of gas. |
| 28 | John Ryan, "B.," . | do. . . . . | Thomaston, . . . . . | Fell in pump-slope trench; ribs injured. |
| 31 | William Conrad, . | do. . . . . | Kalmia, . . . . . | Fall of dirt from rib; back and leg injured. |
| Nov. 4 | Michael Kennedy, . | Bottom man, . . | Beechwood, . . . . . | Jammed between timber and wagon; ribs broken. |
| 5 | William Stone, jr., | Miner, . . . . . | Wadesville, . . . . . | Fall of top coal: shoulder and elbow injured. |
| 5 | Jonat'n Wellingham | do. . . . . | Pine Forest, . . . . . | Slip of coal from rib; arm and shoulder injured. |
| 7 | Michael Dormer, . | Driver, . . . . . | Otto, . . . . . | Caught between chute and wagon; shoulder injured. |
| 13 | James Flanigan, . . | Miner, . . . . . | Eagle Hill, . . . . . | Explosion of gas. |
| 13 | James Ladden, . . | do. . . . . | Richardson, . . . . . | Fall of coal; face and body cut and bruised. |
| 17 | Walter Vaughn, . . | Slate picker, . . . | Lehigh, No. 10, . . . . . | Foot caught in monkey rolls; seriously injured. |
| 18 | Dennis Ford, . . . | Starter, . . . . | Glendower, . . . . . | Explosion of gas; burned slightly. |
| 18 | William Edmonds, | Road man, . . . . | do. . . . . | |

REGISTER OF CASUALTIES —Continued.

| DATE. | Names of persons injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| Nov. 21 | John Trainor, . . . | Miner, . . . . . | Eagle Hill, . . . . . | Explosion of gas; went into heading with naked lamp. |
| 25 | James Edwards, . . | Laborer, . . . . . | Mine Hill Gap, . . . . . | Fall of coal; shoulder badly cut. |
| 28 | Richard Craze, . . . | do. . . . . | Pottsville, . . . . . | Fall of rock; foot badly bruised. |
| 29 | John Cummings, . | Miner, . . . . . | Mine Hill Gap, . . . . . | Struck by piece of coal; eye dangerously injured. |
| Dec. 2 | Wm. Raudenbush, | Bottom man, . . | Otto, . . . . . | Eye burned; accidentally struck by lamp of "butty." |
| 3 | Patrick Kelly, . . . | Driver, . . . . . | Lehigh, No. 10, . . . . . | Fell under loaded car; leg badly hurt. |
| 4 | John V. Ryon, . . | Miner, . . . . . | Mine Hill Gap, . . . . . | Starting chute from gangway, coal run and caught him against wagon, the coal covering him; head and body badly bruised. |
| 8 | James Taylor, . . . | do. . . . . | Wadesville, . . . . . | Lifting lump of coal; piece of rock fell on his hand, cutting top of finger off. |
| 12 | William Davis, . . | do. . . . . | Mine Hill Gap, . . . . . | Fall of top coal; head cut. |
| 12 | John Kline, No. 1, . | do. . . . . | Pine Forest, . . . . . | Dressing off loose coal after blast, when face began to work; jumping back, he slipped and fell on large rock, breaking ribs. |
| 13 | Henry Osman, . . | do. . . . . | Colket, . . . . . | Fall of coal; back and breast injured. |
| 13 | Samuel Lynch, . . | Platform man, . . | Richardson, . . . . . | Pulling large rock from platform; strained across kidneys. |
| 15 | George Raub, . . . | Laborer, . . . . . | Lehigh, No. 11, . . . . . | Dropped fire into half keg of powder; seriously burned. |
| 15 | John Cripplebaur, | do. . . . . | Pine Forest, . . . . . | Explosion of gas; slightly burned. |
| 19 | Thomas Argall, . . | State picker, . . . | Gate Vein, . . . . . | Slipped into pulley-wheel in breaker; leg broken. |
| 19 | Patrick Murphy, 1st, | Bottom man, . . | Beechwood, . . . . . | Side hooks of wagon broke while being hoisted over top of slope, the wagon running back to bottom of slope; injured both men very seriously. |
| 19 | Michael Kennedy, . | do. | do. . . . . | |
| 22 | Joseph Sharpe, . . | Laborer, . . . . . | Palmer Vein, . . . . . | Explosion of gas; stopping battery had naked light, which had been forbidden, and also provided with safety lamp. |
| 26 | George Hein, . . . | do. . . . . | Pottsville, . . . . . | Fall of rock; side badly bruised. |
| 26 | Thomas Moore, . . | Stable man, . . . | Thomaston, . . . . . | Uncoupling wagons; foot crushed. |

## REGISTER OF FATAL CASUALTIES.

| DATE. | Names of Persons Killed. | Name of the Collieries. | Age. | Wife. | Children. | Occupation. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| Jan. 1 | Joseph Slinn, . . . | Beechwood, . . . | . . . . . | . . . . | . . . . | Miner, . . . . | Brushing sulphur out of heading, fired it with naked light, burning face and hands, and from effects of which he died on 21st instant. The coroner's jury censured deceased for not taking advice of the mine boss, and censured boss for not preventing his working there. |
| 24 | James McHugh, . . | Lehigh, No. 8, . . | . . . . | Yes, . . . | 6 | Miner, . . . | Crossing a chute in front of a battery, which he started, the coal therefrom rushing upon him, drove him down the chute, completely covering and suffocating him. |
| Feb. 6 | George Milward, | Wadesville, . . . | Boy, . | . . . . . | . . . . | Driver, . . . . | Riding on empty wagons in mine, he was thrown or fell off, the wagons running over him inflicting internal injuries, from which he died on 8th inst. |
| March 4 | William Crone, . | Rausch Creek, . . | . . . . | . . . . . | . . . . | Miner, . . . . | Explosion of gas. The deceased were working in breast 22 when an eruption of gas or blower from bottom in breast 23 occurred, hearing which they ran to escape towards breast 20, at which point the escaping gas became ignited and exploded, burning deceased so seriously as to cause death a few hours later. The air current was in the direction the deceased were running, and the gas naturally overtaking them the swaying of the safety-lamp carried by Teeney while running, ignited the gas. Crone had placed his lamp in his breast under his clothing, as the marks of the lamp were found burned upon his person. |
| | Thomas Teeney, . | do. . . | . . . . . | . . . . . | . . . . | " . . . | |
| 19 | Lewis Murray, . . | Pottsville Shaft, | . . . . . | Yes, . . . | 2 | Tunnel man, . | Explosion of rend rock, (an explosive containing nitro-glycerine.) The deceased were employed driving tunnel, from west main-gangway north to Mammoth vein, for Hugh Murray & Son, (William,) contractors. Having drilled a round of holes, ten in number, Murray and Mulhearn were engaged charging them with rend-rock, William Murray, George Schramm, and John Bows being engaged near by thawing out cartridges, which were frozen, by holding them over their naked lights. Mulhearn placed the rend-rock in the hole, and Lewis Murray tamped it in with an iron bar about one inch in diameter and seven feet long. Seven holes had been charged, and they were engaged upon the eighth when explosion occurred, which, from all the evidence gleaned at the examination and inquest, was caused by the improper use of an iron tamping bar on this class of explosive. Lewis Murray and James D. Mulhearn were instantly killed. William Murray died on the 20th from injuries. Bows slightly injured, and Schramm uninjured. |
| 19 | James D. Mulhearn | do. | . . . . . | Yes, . . . | 2 | " . | |
| 19 | William Murray, . | do. | . . . . . | . . . . . | . . . . | Contractor, . | |
| May 20 | John Campion, . . | Thomaston, . . . | . . . . . | . . . . . | . . . . | Dirt b'k driver | Coming in with empty dirt dumpers. On passing the tongue of switch they jumped the track, and ran into loaded dumpers on side track, catching him, deceased, between empty and loaded dumpers, causing injuries resulting in death. |
| June 10 | Wm. O. Jenkins, . | Black Heath, . . | . . . . . | Yes, . . . | 9 | Miner, . . . . | Employed skipping pillars with August Orff, miner, and one laborer. Deceased had fired a hole which did no execution, and while Orff was engaged making cartridge to re-charge the hole, deceased was barring at stump, when, it is supposed, part gave way, throwing him down and covering him with coal, gob and dirt, causing death by suffocation. |
| 14 | Frank Kemmery, . | Wadesville, . . . | . . . . . | . . . . . | . . . . | Laborer, . . . | Fall of top rock in breast. |
| July 14 | Andrew J. Morgan, | Rausch Creek, . . | . . . . | Yes, . . . | . . . . | Miner, . . . . | Fall of piece of top rock in heading. Knew that it was loose, but could not place prop, owing to the bottom heaving up. |

REGISTER OF FATAL CASUALTIES—Continued.

| DATE. | Names of Persons Killed. | Name of the Collieries. | Age. | Wife. | Children. | Occupation. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| July 1 | Andrew Eagan, . . | Richardson, . . . | . . . . . | . . . . . | . . . . | Miner, . . . . | Fall of piece of coal from the hickory bench upon him, breaking his back, and from which he died on 8th instant. |
| 16 | Malachi Moore, . . | Mine Hill Gap, . | 16 | . . . . . | . . . . | Driver, . . . . | Car on dirt plane being hoisted, and when near the top of plane the hitching bar attached to safety truck broke, car and truck being precipitated to bottom of plane, where deceased was engaged screening coal, inflicting injuries, from which he died some few hours later. He had been warned not to go there, by the outside boss. |
| 22 | Patrick H. Kelly, . | Thomaston, . . . | 22 | Single, . | . . . . | Miner, . . . . | Deceased was employed, on contract, to rob out stumps and pillars on the Church vein. While engaged breaking a piece of slate in chute he heard something coming down the breast, which was empty, and jumped to side of chute to give way for it to pass him. It proved to be a very large piece of slate, estimated to weigh about eight tons, which, descending the breast with great velocity, demolished the timbers in five batteries, and finally wedging itself in the chute. One prop caught Kelly's leg, holding him fast and knocked him against side of chute, inflicting injuries from which he died following day. |
| 23 | Mathew Koehler or Color. | Richardson, . . . | An old man. | No family | . . . . | Cont. laborer, | Deceased and miner engaged in standing a pair of timbers in East Crosby gangway, and miner picking down some coal to fit them in place, a small piece of coal fell upon deceased, who immediately jumped excitedly to one side and against the side of a mine wagon, fracturing two ribs and inflicting other injuries, from which he died on 27th instant. |
| 28 | Edward Colihan, | Eagle Hill Shaft, | . . . . . | . . . . . | . . . . | Top man, . . . | Deceased was employed at top of inside slope to unhitch side chains from cars as they landed. His partner was sick and a substitute was employed, who missed the chain as cars passed him, the deceased having taken off the chains on his side, the car, as it proceeded, was upset and struck deceased, knocking him against side of tunnel with great violence, causing injuries from which death resulted following day. |
| 21 | Michael Reilly, . . | Beechwood, . . . | . . . . . | Yes, . . . | . . . . | Miner, . . . . | Explosion of gas. George Jones, fire boss, in his morning rounds, found gas in Reilly's chute, and cleared it out. After completing his round, he returned to usual place to make report, and then met Reilly and partner, whom he informed of gas being in their chute, and that gas was being evolved more freely than usual, that they should use great caution, and not use naked light. Notwithstanding which caution, Reilly went into his chute with naked light, and the gas having again accumulated, he ignited it, burning him to such an extent as to result in his death on 1st of August. |
| Oct. 2 | William Harris, . . | Thomaston, . . . | 50 | Yes, . . . | 4 | Miner, . . . . | Explosion of gas. Deceased and Samuel Richards were working in breast with naked lights, in violation of positive orders to use only safety-lamps. Gas having been brushed out of inside breast came into breast worked by deceased, and was ignited from his lamp, burning him so severely that he died on 19th instant. |
| Nov. 13 | Samuel Mosely, . . | Wadesville, . . . | 65 | Yes, . . . | * | Miner, . . . . | Fall of coal. (*All grown up.) |
| 27 | Benedict Trefsger, | East Franklin, . | 32 | " . . . | 3 | " . . . . | Fall of coal. |
| Dec. 11 | Frederick Hoy, . . | Faust & Son, . . | 40 | " . . . | 4 | . . . . . | Fall of rock and slate in breast. |
| 11 | John Eckler, . . . | do. . . | 25 | " . . | 2 | . . . . . | Fall of rock and slate in breast. |
| 11 | William Jamison, | do. . . | 18 | Single, . | . . . . | . . . . . | Fall of rock and slate in breast. |

**Recapitulation and Classification of Non-fatal Accidents, for year ending December 31, 1879.**

| | |
|---|---|
| Explosion of fire damp, | 35 |
| Explosion of powder and blasts, | 11 |
| Falls of coal, slate and rock, | 45 |
| Mine wagons, | 23 |
| Machinery, | 7 |
| Mules, | 6 |
| Miscellaneous, | 31 |
| Total, | 158 |

**Recapitulation and Classification of Fatal Accidents, for year ending December 31, 1879.**

| | |
|---|---|
| Explosion of fire damp, | 5 |
| Explosion of powder, | 3 |
| Falls of coal, slate and rock, | 10 |
| Mine wagons, | 4 |
| Starting battery, | 1 |
| Suffocated by coal, | 1 |
| Total, | 24 |

**Comparative Statement of Casualties, Tonnage, and Employees, for Five Years, in First or Pottsville Division of Mining District of Schuylkill.**

| Years. | Killed. | Injured. | Total. | Total number of employees. | Number employees to each casualty. | Total number tons of coal mined. | Tons of coal mined to each fatal casualty. | Tons of coal mined to each non-fatal casualty. | Tons of coal mined to each casualty. | Tons of coal mined to each employee. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1875 . . . | 28 | 88 | 116 | 8,646 | 74½ | 2,853,629 | 101,915.06 | 32,427.12 | 24,600.05 | 330 |
| 1876 . . . | 28 | 63 | 91 | 8,487 | 93⅔ | 2,317,056 | 82,752 | 27,917 | 25,462.03 | 273 |
| 1877 . . . | 29 | 111 | 140 | 5,847 | 41¾ | 1,580,780 | 54,510 | 15,151 | 11,291.05 | 270 |
| 1878 . . . | 14 | 30 | 44 | 5,300 | 120½ | 1,229,081.03 | 87,791.10 | 40,969.07 | 27,933.13 | 232 |
| 1879 . . . | 24 | 158 | 182 | 6,242 | 34¼ | 1,855,164 | 77,298.10 | 11,741.11 | 10,193.04 | 297.04 |
| Total, | 123 | 450 | 573 | . . . . . | . . . | 9,835,710.03 | 404,267.06 | 128,206.10 | 99,480.10 | |
| Average | 24.6 | 90 | 114.6 | 6,904.4 | 93 | 1,967,142 | 80,853.09 | 25,641.06 | 19,896 | 280.08 |

**Names of Collieries in Operation in the Mining District of Schuylkill, First, or Pottsville Division, during the four years ending December 31, A. D. 1879.**

| Numbers and Names of the Collieries. | Location of Collieries. | Names of Operators. | Coal Produced. | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1875. | 1876. | 1877. | 1878. | 1879. |
| Alaska, | Tamaqua, | A. A. Raabe, | Cannot be given accurately from reports or any data in office. | 82 | 67.18 | 550.13 | 824.00 |
| Beechwood, | Mt. Laffee, | Philadelphia and Reading Coal and Iron Co., | | 65,402 | 103,192.00 | 80,911.02 | 73,057.17 |
| Colket, | Donaldson, | do. do. do. do. | | 11,209 | 24,726.00 | 33,705.13 | 42,969.10 |
| East Franklin, | Upper Rausch Creek, | do. do. do. do. | | 30,086 | 48,367.02 | 3,025.02 | 34,297.04 |
| Eagle Hill, | New Philadelphia, | do. do. do. do. | | 34,550 | 32,219.06 | 74,842.08 | 102,511.09 |
| Forestville, | Minersville, | do. do. do. do. | | 22,367 | 49,317.13 | 5,312.03 | |
| Glendower, | Glen Carbon, | do. do. do. do. | | 24,479 | 58,497.15 | 58,450.08 | 50,698.14 |
| Mine Hill Gap, | Minersville, | do. do. do. do. | | 80,825 | 105,213.05 | 62,099.18 | 64,352.05 |
| Middle Creek Shaft, | Tremont, | do. do. do. do. | | 25,432 | 31,361.15 | 4,697.00 | |
| Otto, | Branchdale, | do. do. do. do. | | 27,756 | 89,989.09 | 71,540.18 | 63,830.06 |
| Phœnix Park, No. 2, | Phœnix Park, | do. do. do. do. | | 25,956 | 31,769.06 | 2.00 | 13,612.00 |
| Phœnix Park, No. 3, | do. | do. do. do. do. | | 22,557 | 22,427.09 | 11,018.07 | 19,305.18 |
| Pine Forest, | St. Clair, | do. do. do. do. | | 37,519 | 53,073.06 | 44,564.08 | 81,268.01 |
| Pottsville Shafts, | Pottsville, | do. do. do. do. | | 28,589 | 48,501.09 | 2,574.07 | 27,781.06 |
| Richardson, | Glen Carbon, | do. do. do. do. | | 8,301 | 62,238.16 | 75,353.18 | 111,229.10 |
| Pyne, | Swatara, | do. do. do. do. | | 17,562 | 10,319.00 / 11,928.14 | 20,026.18 | 22,420.05 |
| Thomaston, | Hecksherville, | do. do. do. do. | | 65,996 | 81,543.16 | 77,429.06 | 123,078.19 |
| Wadesville, | Wadesville, | do. do. do. do. | | 34,607 | 150,261.11 | 23,839.15 | 118,326.06 |
| Kalmia, | Orwin, | Phillips & Sheafer, | | 55,555 | 99,837.09 | 104,879.16 | 88,239.11 |
| Rausch Creek, | Tremont township, | Miller, Graeff & Co., | | 15,764 / 38,535 | 37,835.00 | 60,860.04 | 98,719.01 |
| Lincoln, | do. | Levi Miller & Co., | | 62,498 | 74,188.08 | 104,268.03 | 119,945.03 |
| Swatara, | Swatara, | John D. Felty, | | 541 | 609.15 | 305.04 | 382.15 |
| Lewis Tract, | Minersville, | S. W. Geer and Joseph O'Malley, | | 230 | 127.10 | 189.00 | 430.03 |
| White Oak, | St. Clair, | J. H. Denning & Co., | | 7,542 | 5,952.19 | 751.03 | 2,879.01 |
| Ellsworth, | New Castle, | John R. Davis, | | 9,595 | 5,856.08 | 13,536.18 | 16,229.15 |
| Gettle & Wagner, | do. | W. & J. S. Heffner, | | | 344.06 | 392.11 | 418.00 |
| Chandler Tract, | Minersville, | Patrick Keenan, | | 115 | 56.05 | 164.05 | 316.00 |
| Do. | do. | William Lloyd, | | 145 | | 22.00 | 93.00 |
| Do. | do. | Edward McGovern, | | 353 | | 59.10 | 19.10 |
| St. Clair, | St. Clair, | Joseph Atkinson, | | 1,998 | 491.11 | 965.17 | 2,774.17 |
| Tremont, | Tremont, | Peter Laux, | | 291 | 1,549.07 | 917.16 | 848.10 |
| Eagle, | St. Clair, | George W. Johns & Bro., | | 43,389 | 50,065.05 | 27,862.00 | 49,087.19 |
| Palmer Vein, | New Philadelphia, | Alliance Coal Company, | | 11,447 | 17,240.00 | 27,361.00 | 17,066.00 |
| Gate Vein, | Pottsville, | Gate Vein Coal Company, | | | | 4,396.09 | 3,846.09 |
| Wolfe Creek Diamond, | Minersville, | John W. Davis, | | | | 17,071.03 | 19,455.19 |
| Sharpe Mountain, | Pottsville, | Thomas Wren, | | | | 1,950.00 | 3,657.05 |
| Black Heath, | Minersville, | William H. Harris, | | | | 22,152.10 | 24,910.11 |
| Shaft No. 1, | Tamaqua, | Wood & Pearce, | | | | 4,435.05 | 16,734.10 |
| Lehigh, No. 8, | Coal Dale, | Lehigh Coal and Navigation Company, | | | | 87,078.00 | 118,863.03 |
| Lehigh, No. 10, | do. | do. do. do. | | | 196,871.07 | 101,542.00 | 127,950.15 |
| Lehigh, No. 11, | do. | do. do. do. | | | | | 71,566.13 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Middle Lehigh, | Mahanoy City, | | | | | | 28,990.05 |
| Lorberry, | Lorberry, | S. Faust & Son, | | | | | 648.01 |
| Peach Mountain, | Pottsville, | George Wilson, | | | | | 502.00 |
| York Farm, | do. | Job Rich, | | | | | 975.00 |
| Peach Orchard, | St. Clair, | John Denning, | | | | | 675.05 |
| Hiawatha, | Middleport, | S. Kestenbach, | | | | | 925.00 |
| Chrystal, | New Castle, | Joseph Brady, | | | | | 1,158.00 |
| Middleport, | Middleport, | Louis Lorenz, | | | | | 1,525.04 |
| Palmer, No. 1, | New Philadelphia, | John Harron, | | | | | 273.18 |
| Coal Hill, | | R. Hollahan, | | | | | 458.10 |
| Tuscarora, | Tuscarora, | J. Kershner, | | | | | 229.10 |
| Brockville, | Brockville, | B. F. Palmer, | | | | | 577.00 |
| Kaska William, | | | | | | | 602.00 |
| Peach Orchard, | New Castle, | George Morgan & Co., | | | | | 950.00 |
| Mammoth, | Minersville, | Quinn & Mahoney, | | | | | 338.15 |
| W. C. Big Diamond, | do. | James F. Donahoe, | | | | | 783.00 |
| Small and estimated collieries, | | | | | 299,675 | 72,562.10 | 2,881.10 | |
| Monitor, | Wadesville, | J. H. Denning, | | | 3,394 | | | |
| Hickory Shaft, | St. Clair, | Philadelphia and Reading Coal and Iron Co., | | | 25,361 | | | |
| Eureka, | Donalson, | do. | do. | do. | do. | 9,093 | | | |
| Anchor, | Glen Carbon, | do. | do. | do. | do. | 31,892 | 2,076.11 | | |
| Diamond, No. 1, | Forestville | do. | do. | do. | do. | 19,357 | | | |
| | | | | | | 2,853,629 | 2,317,056 | 1,580,780.00 | 1,229,081.03 | 1,773,612.08 |
| Estimated for local consumption, | | | | | | | | | | 81,551.12 |
| | | | | | | | | | | 1,855,164.00 |

## Report of Employees, Coal Mined, Days Worked, &c., for year ending December 31, 1879.

| COLLIERIES. | OPERATORS. | INSIDE. | | | | | OUTSIDE. | | | | Gross total. | Number mules and horses. | Number locomotives inside. | Number kegs of powder used. | Number days worked by breaker. | Number persons killed. | Number persons injured. | Number tons of coal shipped. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number inside bosses. | Number miners | Number laborers and company men. | Number drivers | Number door boys. | Total. | Number bosses and mechanics. | Number laborers and company men. | Number drivers and slate pickers | Total. | | | | | | | | |
| Alaska, | A. A. Raabe, | | | | | | | | | | | | | | | | | 824.00 |
| Beechwood, | Philad. and Reading Coal & Iron Co. | 3 | 93 | 38 | 13 | 9 | 156 | 8 | 26 | 44 | 78 | 234 | 33 | .. | 1,070 | 240 | 2 | 12 | 73,057.17 |
| Colket, | do. do. | 3 | 92 | 34 | 11 | 1 | 159 | 9 | 22 | 47 | 78 | 237 | 25 | .. | 1,090 | 268 | .. | 4 | 42,969.10 |
| East Franklin, | do. do. | 2 | 59 | 21 | 5 | | 96 | 12 | 33 | 47 | 92 | 188 | 21 | .. | 425 | 206 | 1 | 2 | 34,297.04 |
| Eagle Hill, | do. do. | 3 | 89 | 48 | 12 | 1 | 167 | 13 | 28 | 51 | 92 | 259 | 18 | .. | 967 | 263 | 1 | 9 | 102,511.09 |
| Glendower, | do. do. | 3 | 46 | 33 | 13 | | 100 | 13 | 19 | 63 | 95 | 195 | 24 | 1 | 315 | 230 | .. | 7 | 50,698.14 |
| Mine Hill Gap, | do. do. | 3 | 85 | 63 | 18 | 2 | 191 | 18 | 41 | 65 | 124 | 315 | 35 | .. | 1,050 | 197 | 1 | 10 | 64 352.05 |
| Otto, | do. do. | 4 | 89 | 38 | 10 | | 142 | 12 | 32 | 56 | 100 | 242 | 25 | .. | 935 | 214 | .. | 19 | 63,830.06 |
| Phœnix Park, No. 2, | do. do. | 1 | 21 | 10 | 1 | | 42 | 8 | 8 | 1 | 17 | 59 | 8 | .. | 334 | 110 | .. | 1 | 13,612.00 |
| Phœnix Park, No. 3, | do. do. | 2 | 68 | 14 | 3 | 11 | 98 | 7 | 17 | 37 | 61 | 159 | 7 | .. | 805 | 107 | .. | 2 | 19,305.18 |
| Pine Forest, | do. do. | 3 | 95 | 35 | 10 | 7 | 150 | 13 | 30 | 46 | 89 | 239 | 20 | .. | 1,815 | 239 | .. | 20 | 84,268.01 |
| Pottsville, | do. do. | 3 | 109 | 62 | 10 | 6 | 190 | 11 | 37 | 53 | 101 | 291 | 14 | .. | 575 | 157 | 3 | 11 | 27,781.06 |
| Richardson, | do. do. | 3 | 94 | 40 | 12 | 12 | 161 | 12 | 39 | 71 | 122 | 283 | 26 | .. | 1,435 | 254 | 2 | 11 | 111,229,10 |
| Pyne, | do. do. | 2 | 11 | 13 | 2 | .. | 28 | 6 | 18 | 21 | 45 | 73 | 1 | .. | 460 | 166 | . | 3 | 22,420.05 |
| Thomaston, | do. do. | 3 | 141 | 39 | 24 | 11 | 218 | 11 | 35 | 89 | 135 | 353 | 39 | .. | 1,902 | 268 | 3 | 20 | 123,078.19 |
| Wadesville, | do. do. | 3 | 170 | 79 | 14 | 49 | 315 | 12 | 35 | 76 | 123 | 438 | 32 | .. | 2,305 | 221 | 3 | 11 | 118,326.06 |
| Kalmia, | Phillips & Sheafer, | 1 | 45 | 69 | 9 | 5 | 129 | 7 | 27 | 31 | 65 | 194 | 21 | 2 | 2,435 | 243 | .. | 4 | 88,239.11 |
| Rausch Gap, | Miller, Graeff & Co., | 2 | 104 | 56 | 11 | 15 | 188 | 13 | 32 | 69 | 114 | 302 | 41 | .. | 932 | 251½ | 3 | 2 | 98,719.01 |
| Lincoln, | Levi Miller & Co., | 2 | 100 | 91 | 10 | .. | 203 | 13 | 25 | 78 | 116 | 319 | 43 | .. | 4,350 | 270 | .. | .. | 119,945.03 |
| Swatara, | John D. Felty, | 1 | 2 | 2 | 2 | .. | 6 | 1 | 1 | 1 | 3 | 9 | .. | .. | .. | .. | .. | .. | 382.15 |
| Lewis Tract, | S. W. Geer & J. O'Malley, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *3 | .. | .. | .. | .. | .. | .. | 430.03 |
| White Oak, | J. H. Denning & Co., | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *8 | .. | .. | .. | .. | .. | .. | 2,879,01 |
| Ellsworth, | John R. Davis, | 1 | 13 | 6 | 3 | .. | 23 | 3 | 5 | 12 | 20 | 43 | 6 | .. | 300 | 244 | .. | .. | 16,229.15 |
| Gettle & Wagner, | J. S. Heffner, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *6 | .. | .. | .. | .. | .. | .. | 418.00 |
| Chandler Tract, | Patrick Keenan, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *2 | .. | .. | .. | .. | .. | .. | 316.00 |
| Chandler Tract, | William Lloyd, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *2 | .. | .. | .. | .. | .. | .. | 93.00 |
| Chandler Tract, | Edward McGovern, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *1 | .. | .. | .. | .. | .. | .. | 19.10 |
| Saint Clair, | Joseph Atkinson, | .. | 7 | 1 | 1 | .. | 9 | .. | .. | 4 | 4 | 13 | 1 | .. | 12 | 204 | .. | .. | 2,774.17 |
| Tremont, | Peter Laux, | .. | 5 | 2 | 1 | .. | 8 | 1 | 2 | 2 | 5 | 13 | 2 | .. | .. | .. | .. | .. | 848.10 |
| Eagle, | G. W. Johns & Bro., | 1 | 54 | 39 | 12 | .. | 106 | 4 | 17 | 38 | 59 | 165 | 15 | 1 | 1,332 | 192½ | .. | .. | 46,087.19 |
| Palmer Vein, | Alliance Coal Company, | .. | 37 | 22 | 2 | .. | 61 | 9 | 9 | 21 | 39 | 100 | 8 | .. | 40 | 18 | .. | 1 | 17,066.00 |
| Gate Vein, | Gate Vein Coal Company, | .. | 54 | 31 | 3 | 2 | 90 | 10 | 31 | 22 | 63 | 153 | 3 | .. | 110 | 164 | .. | 1 | 3,846.09 |
| Wolfe Creek Diamond, | John W. Davis, | 1 | 50 | 7 | 4 | .. | 62 | 2 | 10 | 24 | 33 | 95 | 9 | .. | 385 | 171½ | .. | .. | 19,455.19 |
| Sharpe Mountain, | Thomas Wren, | .. | 5 | 2 | .. | .. | 7 | 2 | 3 | . | 5 | 12 | 1 | .. | 75 | 282 | .. | 1 | 3,657.05 |
| Black Heath, | William H. Harris, | .. | 42 | 5 | 3 | . | 50 | 5 | 6 | 17 | 28 | 78 | 9 | .. | 30 | 248½ | 1 | .. | 24,910.11 |
| Shaft, No. 1, | Wood & Pearce, | 1 | 6 | 8 | 1 | | 16 | 2 | 7 | 26 | 35 | 51 | 16 | .. | .. | 260 | .. | .. | 16,734.10 |
| Lehigh, No. 8, | Lehigh Coal and Navigation Co., | 1 | 37 | 49 | 14 | 17 | 118 | .. | . | .. | 100 | 218 | 27 | .. | .. | 225 | 1 | 3 | 118,866.03 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lehigh, No. 10, | Lehigh Coal and Navigation Co., | 1 | 52 | 48 | 12 | 7 | 120 | .. | .. | .. | 100 | 220 | 16 | .. | .. | 225 | .. | 2 | 127,950.15 |
| Lehigh, No. 11, | do. do. | 1 | 32 | 35 | 7 | 5 | 79 | .. | .. | .. | 90 | 169 | 12 | .. | .. | 225 | .. | 2 | 71,566.13 |
| Middle Lehigh, | C. W. Barnes, superintendent, | .. | 149 | 54 | 22 | 7 | 232 | 14 | 45 | 99 | 158 | 390 | 44 | .. | 675 | 484 | .. | .. | 28,990.05 |
| Lorberry, | S. Faust & Son, | .. | 6 | 1 | 1 | .. | 8 | 1 | 2 | 3 | 6 | 14 | 2 | .. | 8 | 83 | 3 | .. | 648.01 |
| Peach Mountain, | George Wilson, | .. | 2 | .. | .. | .. | 2 | 1 | .. | 2 | 3 | 5 | 1 | .. | .. | 242 | .. | .. | 502.00 |
| York Farm, | Job Rich, | .. | 2 | 1 | .. | .. | 3 | 1 | 2 | .. | 3 | 6 | .. | .. | .. | 260 | .. | .. | 975.00 |
| Peach Orchard, | John Denning, | .. | 2 | 1 | .. | .. | 3 | 1 | 1 | 1 | 1 | 3 | 6 | .. | .. | 238 | .. | .. | 675.05 |
| Hiawatha, | S. Kestenbach, | .. | 5 | 1 | .. | .. | 6 | 1 | 1 | 2 | 4 | 10 | .. | .. | 24 | 240 | .. | .. | 925.00 |
| Chrystal, | Joseph Brady, | .. | 2 | 1 | .. | .. | 3 | .. | 3 | 2 | 5 | 8 | .. | .. | 50 | 213 | .. | .. | 1,158.00 |
| Middleport, | Louis Lorenz, | .. | 8 | 1 | .. | .. | 9 | 1 | 3 | 1 | 5 | 14 | .. | .. | .. | 250 | .. | .. | 1,525.04 |
| Palmer, No. 1, | John Harren, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *2 | .. | .. | .. | .. | .. | .. | 273.18 |
| Coal Hill, | R. Hollahan, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *2 | .. | .. | .. | .. | .. | .. | 458.10 |
| Tuscarora, | J. Kershner, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *2 | .. | .. | .. | .. | .. | .. | 229.10 |
| Brockville, | B. F. Palm, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *3 | .. | .. | .. | .. | .. | .. | 577.00 |
| Kaska William, | | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | *3 | .. | .. | .. | .. | .. | .. | 602.00 |
| Peach Orchard, | George Morgan & Co., | .. | 2 | 1 | 1 | .. | 4 | .. | 1 | 2 | 3 | 7 | 1 | .. | .. | 150 | .. | .. | 950.00 |
| Mammoth, | Quinn & Mahoney, | .. | 2 | 2 | 1 | .. | 5 | .. | 2 | 2 | 4 | 9 | 2 | .. | 13 | 60 | .. | .. | 338.15 |
| W. C. Big Diamond, | James F. Donahoe, | .. | 6 | 2 | 1 | .. | 9 | 1 | 2 | 8 | 11 | 20 | 2 | .. | 50 | 80 | .. | .. | 783.00 |
| | | .. | 1,993 | .. | .. | .. | 3,772 | .. | .. | .. | 2,436 | 6,242 | .. | .. | .. | 221 | 24 | 158 | 1,778,612.08 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | Estimated as used at colliery and by workmen, | | | | | | | 81,551.12 |
| | | | | | | | | | | | | | | | | | | | 1,855,164.00 |
| | | | | | | | | | | | | Increase over 1878 of actual shipments, | | | | | | | 544,531.05 |

* Not included in classified totals.

# SECOND SCHUYLKILL DISTRICT.

Office of Inspector of Mines,
Shenandoah, *March 15, 1880.*

To His Excellency, Henry M. Hoyt,
*Governor of Pennsylvania:*

Sir: I have the honor of herewith submitting my annual report for the Second, or Shenandoah Division of the Mining District of Schuylkill, for the year ending December 31, 1879.

It is with regret that I report an increase in the casualties resulting in the loss of life, forty-three persons having been fatally injured during the past year, as against twenty-six for the preceding year.

One hundred and eleven persons were injured during same period, although many of the injuries were of a slight character, as will be seen on reference to detailed statement.

The per centum of fatal casualties attributable to the various causes, are as follows:

| | |
|---|---|
| Falls of coal, slate, rock, &c., | 48.9 |
| Mine cars, | 11.5 |
| Explosions of gas, | 7 |
| Explosions of powder, | 7 |
| Railroad cars on surface, | 7 |
| Miscellaneous causes, | 18.6 |

The per centum of non-fatal casualties, classified, are as follows:

| | |
|---|---|
| Falls of coal, slate, rock, &c., | 36 |
| Explosions of gas, | 16.2 |
| Mine cars, | 12.7 |
| Miscellaneous, | 35.1 |

| | |
|---|---|
| Total number of tons of coal shipped to market, | 4,138,706.17 |
| Sold or consumed at mines, | 248,262.03 |
| Total out-put of coal, | 4,386,969.00 |
| Increase over year 1878, | 1,345,195.00 |
| Total number of employès, | 11,080 |
| Production of coal, equaling in tons per employé, | 395.18 |

| | |
|---|---|
| An increase of employés for year, of . . . . . | 825 |
| An increase of production per employé, . . . . . | 98.11 |
| The ratio of casualties, one life lost to tons of coal mined, . . . . . | 102,022.10 |
| The ratio of casualties, one life lost to total number of employés, . . . . . | $257\frac{29}{43}$ |
| The ratio of casualties, one injured to total number of employés, . . . . . | 100 |

These statements are evidently sufficient to convince the most skeptical that the supervision and discipline of our mines are not of a very high standard, and that improvement in that respect is much needed. Although many of our mine officials take pride in referring to the large out-put of coal from their respective collieries, yet when the fearful cost to human life it has caused is summed up and considered, they should be cast down with remorse. While it is true, that to guard against all accidents in mines is beyond human skill, yet a large majority do not belong to the class of unavoidable accidents. They should be classed about as follows: First, loose discipline, or none at all, (the latter very frequent.) Second, laxity of supervision on part of mine officials; and third, carelessness and ignorance on the part of the victims themselves, the latter an evident result sure to follow first and second classes, verifying the maxim, "An undisciplined army is not any better than a mob."

There is an imperative necessity existing for a legal code of general and special rules for the government of mine bosses and workingmen. This has been referred to in former reports by me, as also by other inspectors. It was fully discussed in the report of 1875 by T. M. Williams, Inspector for Middle District of Luzerne; also in report of 1877, by W. S. Jones, Inspector for Eastern District of Luzerne and Carbon. It is, however, apparent that only when some fearful catastrophe occurs, by which the loss of life is numbered by hundreds, and whole mining villages depopulated of the husbands, fathers, brothers, or sons, that comprised it, that measures are taken to protect life. Legislators then become aroused to a sense of their duty, in providing laws for the protection of the health, safety, and life of their fellow-beings, and then in the excitement enact laws very crude and imperfect, which when brought before our courts are found to be inoperative.

Although this district has been free from any terrible calamities, such as have occurred elsewhere, nevertheless the lives lost through the various causes enumerated in exhibit of casualties, have grown to an astounding number, exceeding, in proportion to the amount of coal produced, that of Great Britain, where so many of those deplorable disasters, embracing hundreds of lives, have occurred.

While it is impossible to prevent all accidents in mines, yet I have no hesitancy in stating, without fear of successful contradiction, that at least

fifty per cent. of the casualties can be prevented by strict discipline, and careful, intelligent supervision.

We therefore pray your Excellency to recommend to the next Legislature the importance and urgent necessity of such amendments to the present mine law, as will make it compulsory with operators to adopt a code of special rules, in conformity with general rules, for the government of mines, defining explicitly every employé's duty, and necessary penalties for their violation, together with such other recommendations as you, in your wisdom, may deem necessary for the protection and safety of life and health.

Very respectfully,

Your obedient servant,

SAMUEL GAY,

*Inspector.*

**Waste of Coal.**

There is no product that is of greater importance to this community, or of more general interest, not only to the people of the State, but to those of the entire country, than coal; therefore, the waste in its production and preparation for market forms a vital element in its consideration.

Although it may not be proper to enter into any discussion of our system of mining in this report, yet its importance is of such paramount interest that the statements and facts that I here present will be considered germane to the duties of mine inspector, and of sufficient weight to attract the attention of those who are directly interested in the anthracite coal fields.

Estimates have been made by many prominent mining engineers of the amount of coal contained in the anthracite fields, and the number of years the supply will last. The latest I have seen, or have any present knowledge of, is that contained in P. W. Sheafer's essay, read before the American Association for the Advancement of Science, which has been very generally accepted as authoritative on the subject.

According to his estimate, "the total amount that can be marketed from all the fields is 8,787,025,333 tons; that with the same ratio of increase in the future as in the annual increase of production for the past ten years, we shall reach our probable maximum output of fifty million tons in 1900, and finally exhaust the supply in one hundred and eighty-six years.

Estimates have also been given of the amount of coal recovered, by different authorities, placing it at from twenty-five (25) to fifty (50) per cent., thus varying in estimates one hundred per cent. from my estimate. I am inclined to think that the first, or smaller, percentage the nearer correct but even that percentage is too large.

That the accuracy of my statements should be as near correct as it is possible to attain, and that a fair average basis from which to compute waste should be taken, I have selected two collieries in the Shenandoah district, working the Mammoth seam, which seam, in this district has an average thickness of thirty-five (35) feet, the angle varying from forty-five (45°) to sixty (60°) degrees.

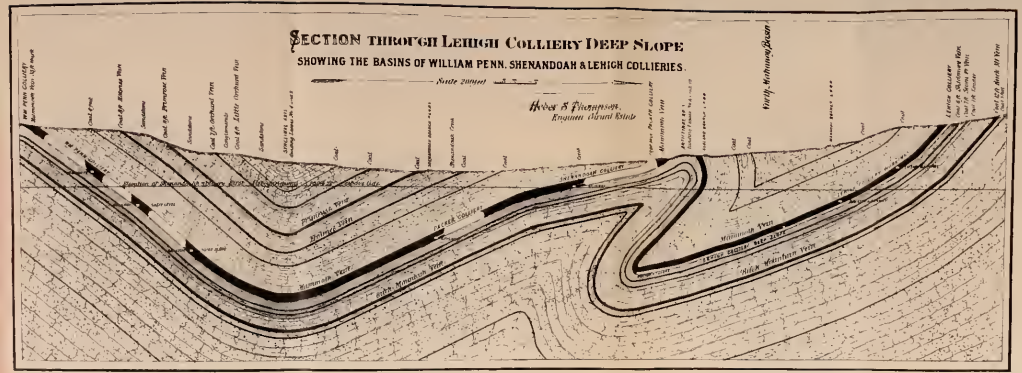
These collieries have not been selected as not having been worked as economically as some others, or that the proportion of coal recovered is not equal in proportion to the area of territory worked out. I have no hesitation in stating that both mines have been as skillfully and economically conducted as any of the mines of the district, and are fair criterions to be governed by in the collection of data from which to make calculations of waste. The enormous loss is not confined to any partiular colliery, but extends throughout the coal fields, wherever the Mammoth seam is worked.

The district selected comprises the greater part of the Mahanoy and Shenandoah basins, extending from the Mahanoy tunnel, on the east, to Girardsville, on the west, a distance, or length, of eight (8) miles, and having a mean breadth of two (2) miles, and area of sixteen square miles, or one twenty-ninth ($\frac{1}{29}$) of the total area of the anthracite coal fields of Pennsylvania, and without doubt contained the most productive measures of moderate depth and easy access, of any territory of the same area yet discovered. I venture to say that there is not another mining district of equal area in the world that produces so large an amount of coal.

These valuable deposits of fuel, this magnificent bed known as the Mammoth, which has enabled this section of the coal region to defy all competition, is being rapidly exhausted by the vast amount of coal sent to market, and the enormous loss in mining, and preparing it for shipment; the time when this seam will be known only as a thing of the past, is but a few years distant, and the same might be well said in regard to it, as was said by a distinguished English writer, of the thick coal seam of South Staffordshire, England, "when we consider the sad loss of life, and the great waste of coal, we have no reason to be proud."

In my calculations, I have assumed the thickness of seam at thirty-five (35) feet, deducting therefrom ten (10) feet for refuse, or about twenty-eight and five tenths ($28\frac{5}{10}$) per cent.; the thickness of the Mammoth seam as taken at eight (8) collieries, by H. S. Thompson, Esquire, engineer for Girard estate, is as follows:

| | Coal. | | Refuse. | | |
|---|---|---|---|---|---|
| | Ft. | In. | Ft. | In. | |
| Lehigh Colliery, No. 3, | 34 | 10 | 5 | 7 | |
| Kehley Run, bottom split, | 22 | 7 | 4 | $1\frac{1}{2}$ | |
| William Penn, | 29 | 4 | 7 | 8 | |
| Bear Ridge, No. 1, | 33 | 5 | 5 | 9 | |
| Colerado, bottom split, | 24 | 4 | 8 | 6 | Coal, 39.4 |
| Colerado, top split, | 15 | 0 | 2 | 9 | Refuse, 11.3 |
| Parker Colliery, No. 4, | 33 | 4 | 8 | 10 | |
| Bear Ridge, No. 2, | 22 | 0 | 2 | 0 | |
| Hammond, bottom split, | 22 | 8 | 4 | 11 | Coal, 38.8 |
| Hammond, top split, | 16 | 0 | 2 | 7 | Refuse, 7.6 |
| Average thickness of coal and refuse in seams, | 31 | 10 | 6 | $6\frac{7}{8}$ | |

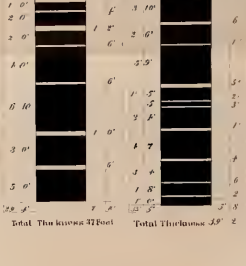


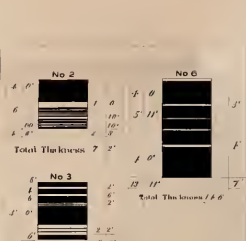

Samuel Gay, Inspector

# SPECIMEN SECTIONS
OF THE
# PRINCIPAL SEAMS
OF
## COAL WORKED.
## Shenandoah District.

No 1 Mammoth
" 2 Skidmore
" 4 Seven Feet
" 5 Buckminsdam
" 5 Mammoth
" 6 Primrose.
" 7 Buckminsdam

Wm Penn Colly
Mahanoy
Plank Ridge
Kehley Run
Bear Ridge No1 Colly
Mahanoy City Colly
Plank Ridge




No. 1 & 5 Taken from Weber & Thompsons Report
Engineer Girard Estate

SAMUEL GAY.
INSPECTOR

The above table gives an average thickness of thirty-one (31) feet ten (10) inches of coal, and six (6) feet six and seven eighth ($6\frac{7}{8}$) inches of refuse, or about twenty per cent.

**Stanton Colliery.**

| | | |
|---|---|---|
| Depth of slope in feet, | | 720 |
| Length of territory under lease, running from east to west, | 6,640 | |
| Average run on dip of seam, | 600 | |
| Area of territory in square feet, on dip, | | 3,984,000 |
| Average thickness of seam, | 35 | |
| Cubic contents of seam, | | 139,440,000 |
| Deducting $28\frac{5}{10}$ per cent. for refuse in seam, leaves, | | 99,600,000 |
| Tons of coal in seam, allowing 25 cubic feet per ton, | | 3,984,000 |
| Tons of coal sent to market, | 581,413 | |
| Six per cent. added for coal used and sold at mines, | 34,884 | |
| Estimated amount of coal to be mined on present level, | 75,000 | |
| Total amount recovered in tons, | | 691,297 |
| Tons of coal lost in mine, and wasted in preparing, | | 3,292,703 |

The first shipment of coal from this colliery, was made in September, 1871. The coal and refuse is hoisted, and dumped into a "pony breaker," where the dirt is separated from the coal, and other refuse taken out, so as to leave but a small amount of anything but clean coal, to undergo the process of breaking, and separating into the various sizes.

By the latter process alone, the waste is equal to fifteen (15) per cent. Mr. Heckschir, of firm operating Kohinoor colliery, estimates the waste in breaking at that colliery for the year 1879, to be fifteen thousand tons more than it would have been, had there been a demand, and fair prices for the larger size coal.*

**Gilberton Colliery.**

| | | |
|---|---|---|
| Depth of slope, in feet, | | 729 |
| Length of territory under lease, from east to west, in feet, | 7,200 | |
| Average run on dip of seam, | 700 | |
| Area of territory on dip, in square feet, | | 5,040,000 |
| Average thickness of seam, | 35 | |
| Cubic contents of seam, | | 176,400,000 |
| Deducting $28\frac{5}{10}$ per cent. for refuse in seam, leaves, | | 126,326,000 |
| Tons of coal in seam, at twenty-five cubic feet to the ton, | | 5,053,040 |
| Tons of coal sent to market, | 1,127,167 | |
| Six per cent. added for coal used and sold at mines, | 67,629 | |
| Estimated amount of coal to be mined on present level, | 50,000 | |
| Total amount recovered, in tons, | | 1,244,796 |
| Tons of coal lost in mining and wasted in preparing, | | 3,808,244 |

**Underground Haulage.**

The above subject has received considerable attention, and many devices, plans, and improvements have been suggested, introduced, and tried, to supersede animal power in the hauling of mineral in underground workings. Some have met with partial, others with great success, in the economy of hauling, as compared with that of animals. I do not propose to discuss the merits or demerits of the various mechanical contrivances in-

* The above article applies only to the Mammoth seam.

troduced, except so far as it relates to the mine locomotive. They are employed to some extent in my district, and, therefore, come directly under my personal observation, and, without doubt, are equal to any mode yet introduced, in point of financial economy, and were it not for the exhaust steam and gases given off by the furnace, might be considered a success in mines that do not generate explosive gas, but when the dangerous character of these gases given off are considered, that the employés are compelled to breathe the air impregnated or vitiated by them, then the steam locomotive cannot be accepted as successful, but rather, in reality, a very great nuisance in the very best ventilated mines.

The dangerous character of the gases generated cannot be questioned, from the fact that they have caused the death of several persons by breathing the air vitiated by them. Although we have been fortunate in this respect in this district, yet there have been some very narrow escapes, several persons having to be carried out of the mines in an unconscious condition, and had not help been near by, to render immediate assistance in taking out of the mines the persons thus overcome, death would have been the result.*

These occurrences took place where the volume of air was from ten to fifteen thousand feet per minute, or from three to four hundred feet per minute for each person employed. During my investigations of the above recited occurrences, I questioned the men regarding the air, and they answered that they did not notice any thing unusual, and that the lights burned freely.

J. J. Atkinson, in his treatise on "Gases met with in Coal Mines," speaking of the carbonic oxide, one of the principal gases given off by the combustion of coal or wood, states that it may be mixed with air, so as to form a compound in which lamps or candles will burn, while life would become extinct. It is probable that many deaths in mines have resulted from this gas in situations where lights have continued to freely burn.

It appears more than probable, that the deaths of the men and boys in the late accident at Hartley colliery, England, arose in a great measure from this gas, (carbonic oxide,) given off by the furnace, after the stoppage of the air current by the closing of the shaft; inasmuch as the lights used by the workmen engaged in clearing the shaft, appeared to be rather increased in brilliancy than otherwise, at the time when the worst effects were felt from the escaping gas. The mine did not give off any fire damp, and very little choke damp.

There is nothing that can be introduced in mines, as a successful improvement in its workings, that is liable to impair the health, and increase the danger to lives of persons employed therein; this the steam mine locomotive does, as is proven by the suffocation of the men above recited, as also the many complaints from workmen of the effects of the gas thrown off by them.

* Seven persons lost their lives by breathing gases given off by a mine locomotive, at Weathersfield mine, Brooksfield township, Ohio, in July, 1877.

I endeavored by every means, to have the cause of these complaints removed, but found the only successful remedy was the removal of the locomotive from that part of the mine where the gas thrown off would at all vitiate the air supplying the workmen, and a reëmployment of the mules.

#### Ventilation and Improvements.

Improvement of ventilation has received considerable attention during the past year. Eight new fans have been erected; three of them at collieries owned and operated by the Philadelphia and Reading Coal and Iron Company, the remaining five at collieries operated by individuals. The following are the names of the collieries, where erected, and diameter of each:

One at Boston Run colliery, diameter 18 feet.

One at North Mahanoy colliery, diameter 15 feet.

One at Knickerbocker colliery, diameter 15 feet.

One at Lawrence colliery, diameter 15 feet.

One at Suffolk colliery, diameter 18 feet.

Two at William Penn colliery, diameter, one 12 feet, and one 7 feet.

The first three are of the Guibal pattern, and substituted for common fans of smaller dimensions that were in operation. The Guibal fans bid fair to supersede all other ventilating machinery.

In this district there has been a number of mechanical contrivances employed in and outside to circulate large and constant volumes of air through the underground workings; many of them I have closely observed, and have become further convinced, that the Guibal fans are the most efficient and economical ventilators that have yet come under my notice.

To arrive at a definite conclusion as to the merits or demerits of any machine used for forcing or drawing a given quantity of air through the intricate passages of a mine, we must first understand something of the action of the natural laws governing it, for we cannot calculate the value of any of them alone by the volume of air discharged. The resistance offered must be taken into consideration as well, or in other words, the amount of ventilating pressure conjointly with the quantity of air discharged.

Take, for the purpose of comparison, two ventilating machines of similar construction in every respect, actual power employed the same, and placed at different mines. One machine may discharge one hundred thousand feet per minute, while the other may not exceed one fourth that amount. Under the foregoing conditions, certainly the discrepancy could not be charged to the construction of the machine, and is therefore due to other causes, and they, resistance or friction, often the result of incompetency in the construction of the air-courses, and the lack of knowledge of the natural laws governing the air currents in their passage through the mines; or, to the difference in the lengths of the passages.

It is an unquestionable fact that ignorance, to a lamentable extent, prevails among those employed in and about the mines; that great improvement in the qualifications and intelligence of many mine officials is very much needed is evident, when we find many of them having no knowledge

whatever of the laws that govern the atmosphere or ventilating currents passing through the avenues of the mines, which is so very essential to the proper and intelligent performance of their important duties, and upon which the lives and health of so many depend.

To those who understand the natural laws governing ventilation, it requires no argument to convince them of the importance of large openings through which the ventilating currents pass, and the positive necessity of keeping them free of all obstructions, but it needs something much stronger than argument to impress this upon the minds of those that are ignorant of them. Until those having control of collieries become more conversant with these laws, we cannot expect or hope for any very great improvement in the ventilation of mines.

I do not wish to be understood as conveying the impression that all our mine officials belong to the latter class. There are some very intelligent men among them. Foremen who do not devote a large share of their time to inventing excuses, with which to meet the inspector, upon his visit to their mine, but who are ever prepared to receive him, and give forth proof of their competency by their work. By passing through the mine, the qualification of the foreman can be judged without the asking of many questions or reception of excuses.

#### Explosions of Gas.

There were, during the year, thirteen accidents under this head, by which three persons were fatally, and sixteen persons slightly burned.

On the morning of the 31st May last, at Glendon colliery, Joseph Nokes and Thomas Bradley, fan boys, aged about thirteen years, respectively, in company with John Ryan and John O'Niell, went into the mine together.

William F. Richardson, fire boss, whose duty it was to make a careful examination of all the workings, and see that they were free from fire-damp before the men entered, in his examination before the coroner, stated that he had found considerable gas standing in the West Buck Mountain gangway, that it was about eighteen inches below the collars at the face, and decreasing in height, wedge shape, terminating at second cross-hole, a distance of about ninety feet from the face; that both chutes, (position of which will be seen on reference to sketch attached,) five by six feet square and thirty feet long, were full of gas. That upon passing through second cross-hole and entering air-way he found John Curran, miner, who had entered that part of the mine prior to the examination, sitting upon a box, in which he kept his supplies, and that he was engaged making up a charge of powder; that Curran asked him "how are things in there," and that he answered, "there is considerable gas. You stay in here, and do not go out on the gangway;" that he (Richardson) then passed out to the gangway, and waited at the first check-door until the fan boys came in. Upon their arrival, in company with O'Niell and Ryan, laborers, who worked for Curran in the air-way, he said to the latter, as they were about to extinguish their lights, "that they needn't blow out their lamps before they reached

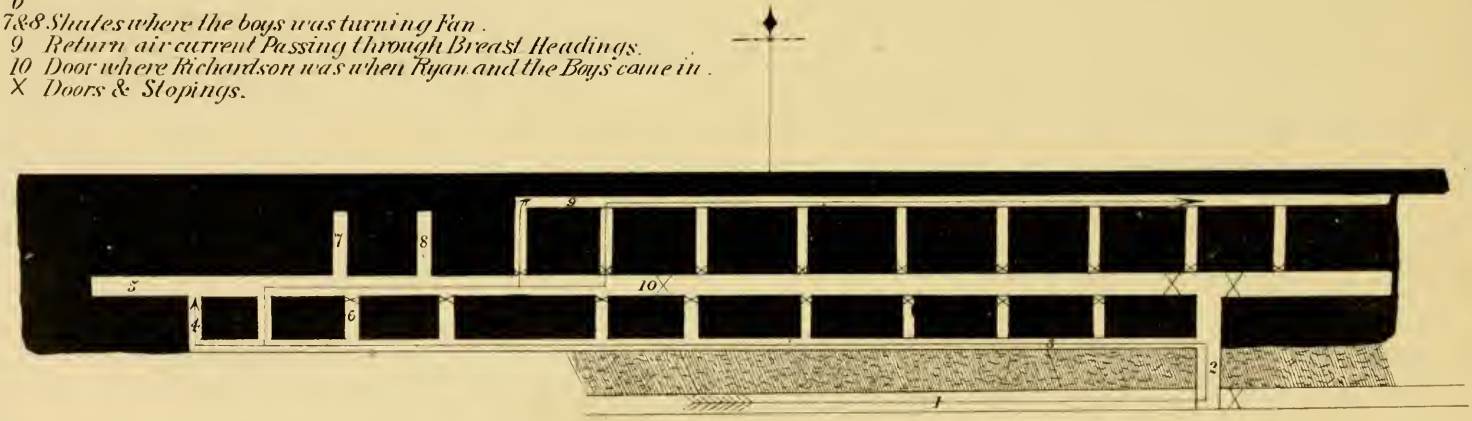
Sketch No.1

# PLAN OF
# WORKINGS.

Where the Explosion occurred on the 31st of May 1879.
Glendon Colliery, Mahanoy City.

REFERENCE.

No 1 *Intake air current.*
2 *Tunnel from 7 foot to Buckmountain.*
3 *Airway.*
4 *Cross cut from air way to Gangway.*
5 *Gangway.*
6
7&8 *Shutes where the boys was turning Fan.*
9 *Return air current Passing through Breast Headings.*
10 *Door where Richardson was when Ryan and the Boys came in.*
X *Doors & Stopings.*




*Samuel Gay, Inspector.*

the fan, that they could go in, but should not come out on the gangway after the fans were started.

The boys blew out their lamps and worked in the dark at the fans. O'Neal, upon reaching his working-place, assisted Curran in tamping a hole that he had drilled, and when ready fired it, retreating to second cross-hole, (3,) until charge exploded, after which O'Neal, taking his shovel, went into a cross-hole (4) near the face of gangway, to complete some unfinished work. While engaged clearing the road, the explosion of gas occurred, by which the fan boys were burned in such a shocking manner, that they died in great agony a short time afterwards. Curran and Richardson were slightly burned, while O'Neal and Ryan escaped uninjured. Richardson and Curran were held under bail to answer at court. Under the act of Assembly both were indicted for manslaughter, and at November term of court Richardson was tried before Judge Walker. The jury was an unusually intelligent one. The trial occupied from Tuesday until Saturday night, and happily for the defendant, was concluded by a verdict of acquittal. The gas, however, was fired, and two deaths were caused by the explosion. Fire damp does not ignite spontaneously. Somebody must have set a light to it, and who that somebody was I made every effort under the law to discover. It was not the boys, the unfortunate victims of the explosion, for all the evidence produced proved that they had no lights, necessarily it must have been some one of the other four there present.

This case marks an important era in the history of mine ventilation, and is one of the most significant trials had under the act of 1870. Public attention has been called in this forcible manner, to the provisions made for the safety of those who work in the mines, and to the careless and criminal disregard, on the part of many miners, of the very precautions provided for their safety.

Curran had entered the mine prior to the examination and report thereof by the fire boss, Richardson, in direct violation of the law, and notwithstanding notice that I had a short time prior to accident given him. Richardson, in contravention of law, had allowed O'Neal and Ryan to pass him with naked lights, and further, allowed Curran to remain in his working-place in the air-way, fully cognizant that he was surrounded by a large volume of gas.

Thus, notwithstanding all the precautions provided by the mine act, and their attention particularly called by me to the danger existing, and the urgent necessity of very great care being exercised, they neglected every precaution appertaining to safety, causing the loss of two lives. It is an indisputable fact that there are men in every mine who, either in a spirit of recklessness, or in their anxiety to earn more than their fellow-workmen, will and do violate all the provisions of the law enacted for their own safety, or the dictation of the most ordinary common sense.

It may be said that there has scarcely ever been an explosion of fire-damp, in which somebody has not been to blame, and in the explosions of

gas which have occurred during the past five years in this county, it will be seen, on reference to the reports, that in three fourths of the accidents from this cause, they have been the result of carelessness or criminal neglect. If men will not use ordinary precaution to protect their own lives against the deadly fire-damp, when duly warned of its whereabouts, the Inspector will, whenever brought to his attention, call on the law to enforce the dictates of prudence. The duties of mine bosses, as well as workmen, are very clearly and minutely prescribed by the act of Assembly, copies of which have been distributed at all the collieries, and they may feel assured that they will be held to strict accountability for the execution of all the provisions of the act. The miners should uphold and assist the officials in holding every man a criminal who recklessly jeopardizes the lives of his fellow-workmen.

On November 21 last, John O'Brien, aged thirty-three years, was instantly killed, at Stanton colliery.

The deceased, with a number of others, had a contract to rob back the east side gangway. The system adopted was that known as "opening back-breasts." Sketch herewith attached, and marked No. 2, shows the manner in which the breast was opened from the air-way. The seam, or vein, was about thirty-six feet thick. This allowed sufficient thickness of coal to drive back-breasts over the chutes driven on the bottom slate.

The breast in which O'Brien worked was driven about ten or fifteen yards, when a heavy fall of coal occurred, completely blocking it, so that he could not get in until considerable coal had been loaded from the breast. On the day of accident, O'Brien and one of his partners, after consultation, together, agreed that they would go on separate sides of the breast, and try to judge by listening to the rushing coal as it was being loaded, whether the breast was near empty or not.

As they were passing through the battery door, between the gangway and the air-way, a fall occurred, forcing the gas down upon the naked lights with which they were provided. O'Brien was blown through the battery that he had just traversed, and instantly killed.

A few days prior to the occurrence of the accident, I had examined the breast in which these men were working, and had cautioned them to be careful, more particularly in regard to use of safety lamp, as I had prevented them, at that time, from entering the breast until he had procured one, a precaution that he at the time considered unnecessary and useless.

The velocity of air at the time was over five hundred feet per minute, which was undoubtedly vastly increased by the fall that took place. Therefore, in consideration of all the attending circumstances, it is doubtful whether even the use of the safety lamp would have prevented the ignition of the gas,* as the velocity of the current would, in all probability, have blown the flame through the meshes of the lamp, if held exposed at the time, yet the necessary precaution should have been taken.

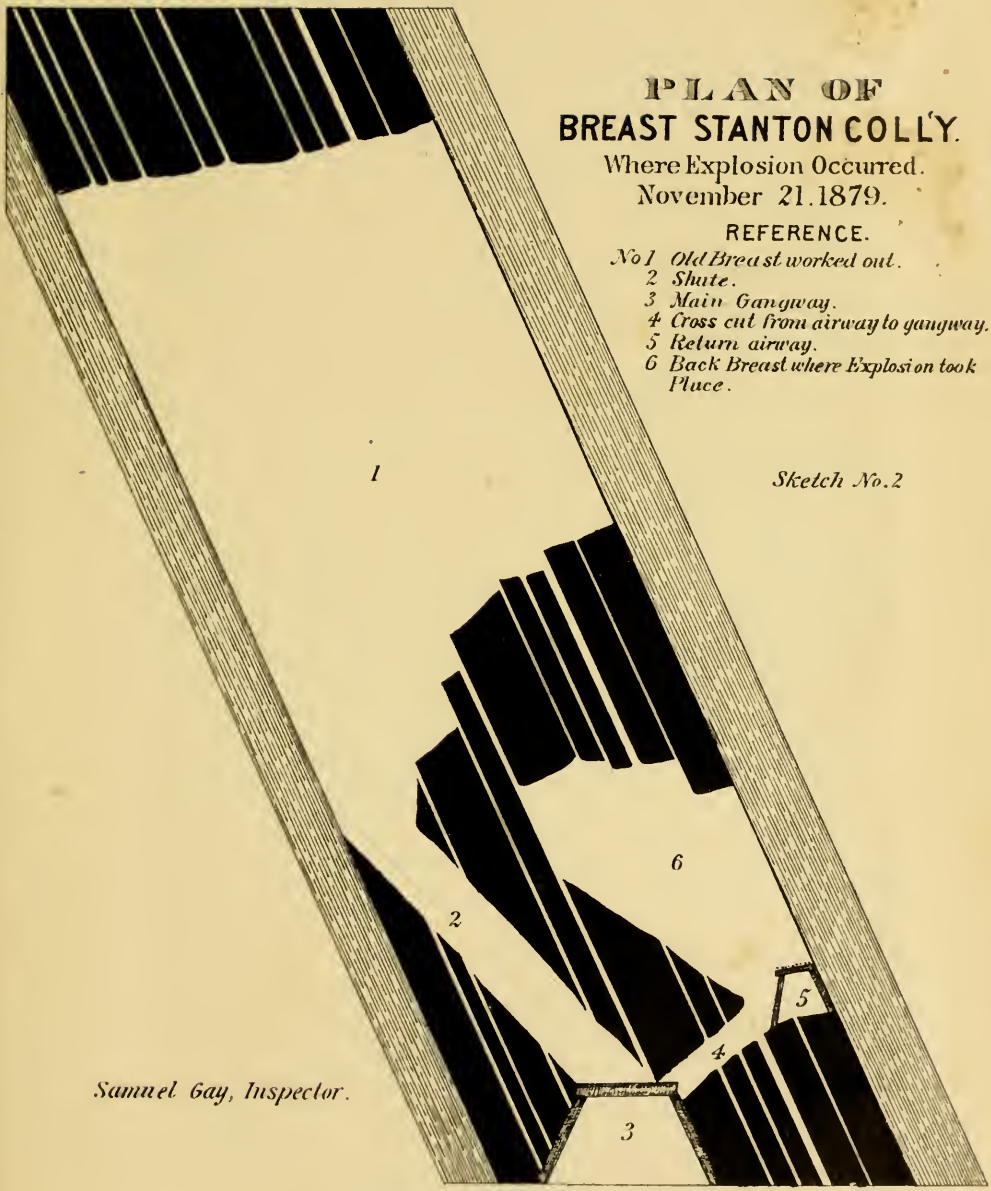
* No gas had been detected in this part of the mine from the time robbing commenced until the day of explosion.

# PLAN OF
# BREAST STANTON COLLY.

Where Explosion Occurred.
November 21. 1879.

REFERENCE.

*No 1 Old Breast worked out.*
*2 Shute.*
*3 Main Gangway.*
*4 Cross cut from airway to gangway.*
*5 Return airway.*
*6 Back Breast where Explosion took Place.*




*Sketch No. 2*

*Samuel Gay, Inspector.*

Explosions of Powder.

There were seven accidents from this cause, by which two were fatally and five non-fatally injured.

I herewith give the particulars connected with two of these accidents, as going to show the carelessness of miners in handling explosives, and how reckless they become in the execution of their dangerous work.

James Cale, miner, aged forty-two, at Shenandoah City colliery, on 25th July last, had, with his laborer, drilled a hole in the bottom rock, which he charged with powder, and ignited, but failed to explode. He then concluded to withdraw the tamping by drilling it out with drill and hammer, which exploded the powder, blowing both Cale's arms off, and otherwise injuring him, causing death.

James Hays, miner, at Plank Ridge colliery, on 9th December last, lost his life from an explosion, under the following circumstances, as detailed by his brother, who was with him: "We had drilled two holes, one on each side of the breast, and had the charges ready to fire. I retired to the cross-heading leading through the pillar, and saw my brother light one of the shots. He then crossed to the other side of the breast, and was there some time, trying to light the other shot. I called to him several times to come away, or he would be shot. He said: "Hold your tongue; I have plenty of time." I shouted: "For God's sake come away," and was rushing towards him to pull him away, when the first charge exploded. He had the second shot ignited, and had taken a few steps towards me. He was struck on the back of the head by a piece of the flying coal. I caught him in my arms, but he was dead. He never spoke afterward."

Comment is unnecessary.

Falls of Coal, Slate, Roof, &c.

There were of the above class of accidents fifty-six, by which eighteen lost their lives, and thirty-eight were seriously injured.

It will be observed from the number of persons fatally or seriously injured, that there is no class of accidents connected with the working of mines so frequent, nor any that show a larger percentage directly attributable to culpable negligence.

Upon examination into the causes of these accidents, it is painfully evident that at least fifty per cent. are clearly the result of either carelessness, neglect, or recklessness. In some instances, through the ignorance or want of proper discipline on the part of the inside foreman, but in the great majority of cases, directly chargeable to the miners themselves. Insecure roof, that should be taken down, is left standing until it suddenly falls, crushing the men beneath it. A shot is fired, the miner hurriedly, scarcely waiting for the reverberation of the explosion to have died out, returns to see what execution has been done, or to again resume work without making any examination whatsoever as to the condition of the surrounding coal, or other material; again in working his breast many yards ahead, without placing necessary props to sustain the top and secure their safety; and very fre-

quently when ordered to place props in dangerous places, neglecting to do so, until they are made to suffer by a fall, seriously or fatally injuring them for their neglect.

#### Mine and Railroad Cars, Miscellaneous.

There were ten lives lost by mine and railroad cars, and seven lives lost through miscellaneous causes. The oft-repeated words, "carelessness, neglect, reckless," apply with equal force to the above class of accidents as to that of any other class occurring in or about the mines.

Until the law is so amended as to enforce better discipline, and legal penalties imposed for an infraction of rules, we cannot hope to see much improvement in this class of accidents, the natural penalties of loss of life or serious personal injury does not seem to be sufficient to deter men from taking risks that it would scarcely be supposed any sane man could be guilty of.

The running of cars upon inside planes, slopes, through door openings, and on or past turn-outs, more particularly the coupling and uncoupling of trains, is always attended with great danger, that requires the utmost precaution to avoid injury, the more so, as this work is performed in the dark passages of the mine, with only such light as the miner's lamp may show. Yet with all these attendant dangers constantly surrounding them, many, very many of the employés exercise less care or prudent caution than a man working on the surface, in the light of day. We hope the next Legislature will so amend the mine law as to punish with severe penalties every person employed in or about the mines who will be found guilty of neglect, carelessness, recklessness, or infraction of rules made for their safety.

Tables showing the number of collieries operated by the several corporations and individual firms, amount of coal produced by each class, number of persons employed, and ratio of tons per fatal casualty:

#### Philadelphia and Reading Coal and Iron Company.

| | |
|---|---|
| Collieries operated, | 18 |
| Tons of coal produced, | 1,839,622 |
| Average number of tons per colliery, | 102,202 |
| Ratio of tons per person employed, | 404 |
| Number of persons killed, | 17 |
| Ratio of tons of coal per life lost, | 108,213 |
| Number of employés, | 4,530 |
| Average number of days worked, | 218 |

#### Philadelphia Coal Company, Controlled by Lehigh Valley Railroad.

| | |
|---|---|
| Collieries operated, | 4 |
| Tons of coal produced, | 623,818 |
| Average number of tons per colliery, | 155,954.10 |
| Ratio of tons per person employed, | $420\frac{9}{10}$ |
| Number of persons killed, | 7 |

| | |
|---|---|
| Ratio of tons of coal per life lost, | 89,116.17 |
| Number of employés, | 1,482 |
| Average number of days worked, | 241 |

**Lehigh and Wilkes-Barre Coal Company.**

| | |
|---|---|
| Collieries operated, | 3 |
| Tons of coal produced, | 322,530 |
| Average number of tons per colliery, | 107,510.13 |
| Ratio of tons per person employed, | 392 |
| Number of persons killed, | 1 |
| Ratio of tons of coal per life lost, | 322,530 |
| Number of employés, | 822 |
| Average number of days worked, | 188 |

**Individual Firms.**

| | |
|---|---|
| Collieries operated, | 23 |
| Tons of coal produced, | 1,509,431 |
| Average number of tons per colliery, | 65,627.09 |
| Ratio of tons of coal per person employed, | 356.09 |
| Number of persons killed, | 18 |
| Ratio of tons of coal per life lost, | 83,857.05 |
| Number of employés, | 4,240 |
| Average number of days worked, | 182 |

Six per cent. has been added for coal used and sold at mines.

In reviewing the above comparative statements between individual collieries and those of corporations, it would appear that there was a very large discrepancy between the producing power of the employés in each class, but when the number of days worked are taken into consideration with the number of tons produced per employé, the ratio of production would stand as follows:

Corporations, $408\frac{13}{20}$ tons per year per employé.

Individuals, $420\frac{13}{20}$ tons per year per employé.

Which gives a more favorable exhibit for individual enterprise. More so, in fact, when it is known that many of these collieries are of very small capacity, working small seams, and that of the one million five hundred and nine thousand four hundred and thirty-one tons of coal produced by them, over one half was the production of seven collieries.

The William Penn standing first in tonnage, of individual firms, having shipped to market one hundred and seventy-eight thousand four hundred and forty-five tons of coal. Taking all the collieries in operation during the year, Packer, No. 4, operated by Philadelphia Coal Company, stands at the head of the list in shipments, the tonnage sent to market was two hundred and forty-eight thousand three hundred and forty-one, exclusive of coal used or sold at the colliery.

This, undoubtedly, is the largest shipment of coal ever made from the Schuylkill region from a single opening with one breaker. I venture to

say that there was as much or more refuse than coal taken from the mine, equaling a total out-put of coal and refuse of five hundred thousand tons for the year.

The greatest number of days were worked by this colliery, namely, two hundred and eighty, or over eight hundred and eighty-six tons of coal per day. Twenty-seven thousand tons were shipped in the month of October.

The collieries owned by the Lehigh and Wilkes-Barre Coal Company, and operated by E. B. Leisenring, can not boast of the largest out-put of coal from a single colliery; but I refer, with pleasure, to the fact that the officials in charge of these mines have greater reason to feel proud that in a production of three hundred and twenty thousand tons of coal, but one life was lost, that of John McGee, aged seventy years, and purely accidental.

It may possibly be claimed by many that it is good luck, but I am not of that school that put faith in luck, but say that the credit is due to good management, and that the lion's share is to be credited to Thomas Reese, inside superintendent of Nos. 1, 2, and 3 collieries.

Indian Ridge shaft has, during the past two years, produced nearly three hundred thousand tons of coal without a fatal accident.

There are, also, some individual collieries that have very favorable records, in which the inside bosses, connected therewith, have very good reason to refer to with pride. And, without specially desiring to individualize, I mention the Kehley Run colliery, which colliery, during the term I have been inspector of mines, (four years,) no fatal accident has occurred, and having produced, in that time, nearly four hundred thousand tons of coal.

It is true, that the dangers to contend against are greater in some collieries than in that of others, but they are just as numerous and glaring in above mentioned collieries as in that of any other collieries in my district.

## REGISTER OF FATAL CASUALTIES.

| Date. | Names of Persons Injured. | Names of the Collieries. | Occupation. | Age. | Wife. | Children. | Cause of Accident. |
|---|---|---|---|---|---|---|---|
| Feb. 13 | Dennis Daley, | Hammond, | Starter, | 21 | Single, | | Rush of coal in chute. |
| 19 | John McGuire, | William Penn, | Miner, | 33 | Yes, | 5 | Fall of coal. |
| 24 | Jonath. Goodhead, | West Shenandoah | do. | 32 | Yes, | | Fall of coal. |
| Mar. 4 | Matthew Reed, | Packer, No. 4, | Engineer, | 20 | Single, | | Crushed between locomotive and car. |
| 13 | Con Callahan, | Schuylkill, | Miner, | | | | Fall of coal. |
| 24 | John McGee, | Honey Brook, | Laborer, | 70 | | | Rush of loose coal. |
| Apr. 4 | John Costello, | Lost Creek, No. 2, | Miner, | | Yes, | | Fall of coal. |
| 8 | John Leonard, | Conner, | do. | | Yes, | | Struck by mine car. |
| 25 | William Webb, | Cuyler, | do. | 36 | Yes, | 6 | Caught by mine car while closing door. |
| 26 | Jacob Yenfer, | Boston Run, | do. | 36 | Yes, | | Prematurely returning to a shot he supposed had missed fire. |
| May 20 | Alex. Cuselck, | Bear Ridge, No. 1, | Starter, | | Yes, | 6 | Fell down a breast. |
| 24 | Andrew Deegan, | Lawrence, | Bottom man, | | Single, | | Fell into gun-boat pit. |
| 26 | James Herrity, | Cuyler, | Miner, | | Yes, | 2 | Fall of coal from insufficient propping. |
| 28 | Joseph Nokes, | Glendon, | Fan boy, | 13 | | | Explosion of gas. |
| 28 | John Bradley, | do. | do. | 13 | | | Explosion of gas. |
| June 2 | Peter Kulpe, | Mahanoy City, | Miner, | 45 | Yes, | 1 | Fall of top from insufficient propping. |
| 25 | James Cole, | Shenandoah City, | do. | | Yes, | 6 | Explosion of shot, while engaged drilling out charge. |
| 27 | John Coehlin, | William Penn, | do. | | Yes, | 2 | Fall of coal. |
| July 16 | Frank Fleitchner, | Schuylkill, | do. | | Yes, | 2 | Crushed by loose coal rolling down from pile from which he was loading a wagon. |
| Aug. 25 | Fatrick Hoctor, | Boston Run, | Car loader, | 20 | Single, | | Crushed by railroad car against platform. |
| 30 | Griffith Watkins, | Bear Ridge, No. 1, | Slate picker, | 11 | | | Dumper ran away on plane, running through side of boiler-house, crushing deceased, who was in the act of getting a drink of water. Coroner's jury censured John Joyce, who was working on plane, for doing work he did not understand, and unauthorized. |
| Sept. 11 | Patrick O'Boyle, | Packer, No. 4, | Driver, | 16 | | | Attempting to cross railroad track in front of moving train of loaded cars. |
| 16 | John Davis, | Furnace, | Miner, | | Yes, | | Fall of coal. |
| 21 | John Clarke, | Plank Ridge, | do. | | Yes, | | Barred down piece of coal upon himself. |
| 25 | John Rice, | Lehigh, No. 3, | Laborer, | | | | Fall of slate in gangway. |
| 26 | Martin Higgins, | Knickerbocker, | Driver, | 16 | | | Crushed between cars at bottom of slope. |
| Oct. 8 | John Davis, | Turkey Run, | Laborer, | 18 | | | Fall of coal. |
| 21 | John O'Brien, | Stanton, | Miner, | 33 | Yes, | 5 | Explosion of gas. |
| Nov. 10 | James Norton, | Glendon, | do. | 36 | Yes, | 5 | Fall of roof. |
| 24 | Martin Burke, | Suffolk, | Switch tender, | 16 | | | Fell under mine locomotive, on surface. |
| 24 | John Bollskzey, | Kohinoor, | Miner, | | | | Fall of coal. |
| Dec. 11 | James Hays, | Plank Ridge, | do. | | | | Explosion of blast. |
| 18 | Michael Jenkins, | Kohinoor, | do. | | Yes, | | Fall of coal. |
| 18 | Adam Martin, | Lehigh, No. 3, | Loader, | | | | Fall of coal. |

## REGISTER OF CASUALTIES RESULTING IN DEATH.

| DATE. | Names of Persons Injured, resulting in death. | Names of the Collieries. | Occupation. | Age. | Wife. | Children. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| Jan. 13 | Samuel Southall, . | West Shenandoah | Miner, . . . . | 58 | Yes, . . | . . . . | Fall of clay, health was very much impaired; died from injuries three weeks after accident. |
| 19 | George Burt, . . . | Kohinoor, . . . . | do. . . . | 27 | . . . . . | . . . . | Fall of coal. |
| Feb. 5 | Martin Larkin, . . | Plank Ridge, . . | Outside lab'r, | 60 | . . . . . | . . . | Caught by railroad car, inflicting compound fracture of the limb, from effect of which he died. |
| 27 | Israel Price, . . . | St. Nicholas, . . | Miner, . . . . | . . . | Yes, . . | . . . . | Fall of coal. |
| Apr. 2 | Patrick McAndrew | Cuyler, . . . . . | do. . . . | . . . | Yes, . . | . . . . | Fall of coal, inflicting injuries that caused his death two weeks from date of accident. |
| 17 | James Dillman, . . | Turkey Run, . . | do. . . . | 60 | Yes, . . | . . . . | Fall of coal, inflicting such injuries as to cause death subsequently. |
| May 26 | Patrick Dunlevy, . | Lost Creek, No. 2, | Loader, . . . | . . . | Yes, . . | 1 | Fall of coal, died four days after accident, from injuries received. |
| June 28 | Harry Brennan, . | Packer, No. 4, . . | Slate picker, . | . . . | . . . . . | . . . . | Scull fractured, fell from breaker on to a roller segment. |
| July 15 | Patrick Coyle . . . | Suffolk, . . . . . | Loader, . . . | 18 | Single, | . . . . | Riding on bumper between mine wagons, and on rounding curve attempted to jump off, being caught between wagon and platform, inflicting injuries that caused death a few days later. |

| DATE. | Names of Persons Injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| Jan. 9 | Robert Guy, | Miner, | Knickerbocker, | Explosion of powder; hands and face burned. |
| 9 | John O'Neill, | do. | Elmwood, | Explosion of powder; severely burned. |
| 5 | John Simmet, | Engineer, | Indian Ridge, | Scalded by hot water, while inside of boiler. |
| 13 | John Irwin, | Miner, | Girard, | Fall of piece of coal; collar-bone broken. |
| 23 | John Welsh, | do. | Elmwood, | Fall of top coal and slate; small bone of leg broken, and ankle dislocated. |
| 30 | Thomas Moore, | do. | West Shenandoah, | Fall of coal; back and leg bruised. |
| Feb. 14 | John Davis, | do. | Elmwood, | Fall of slate; back injured. |
| 21 | Thomas King, | | Schuylkill, | Mine cars; ribs and back injured. |
| 24 | Jerry Coakley, | | Shenandoah City, | Chain and car on head of slope; legs injured. |
| 24 | Philip McBreen, | | Elmwood, | Explosion of gas; hands and face slightly burned. |
| Mar. 7 | James Deveney, | | Plank Ridge, | Fall of coal; leg broken. |
| 17 | John Webb, | Boss, | West Lehigh, | Three ribs fractured; jammed between cars. |
| 29 | William Jones, | | William Penn, | Struck by coal flying from shot. |
| 29 | Ben Williams, | | St. Nicholas, | Explosion of gas. |
| 29 | Elias Bertolette, | | Suffolk, | Jammed by mine wagon; leg broken. |
| April 3 | Simon Kelly, | | Packer, No. 4, | Fall of coal. |
| 4 | Philip McBreen, | | Elmwood, | Fall of coal; back hurt. |
| 4 | John Condon, | | Boston Run, | Fell down manway. |
| 9 | Martin Loftus, | | Hammond, | Fall of coal; leg broken. |
| 9 | Conrad Carl, | | do. | Struck by piece of coal; hips injured. |
| 15 | Thomas McCormack | | West Shenandoah, | Finger cut off; caught between bumpers of cars. |
| 15 | Patrick Luskin, | | Conner, | Shoulder dislocated by fall. |
| 16 | Alexander Rice, | | William Penn, | Premature explosion of blast. |
| 16 | Fred'k Ralzebery, | | do. | Premature explosion of blast. |
| 19 | George Graff, | | Mahanoy City, | Struck by piece of coal; head injured. |
| 28 | John West, | | Shenandoah City, | Fall of coal; hip dislocated. |
| 29 | William Brett, | | Knickerbocker, | Leg cut, by piece of coal rolling against it. |
| May 2 | John Conly, | Miner, | Elmwood, | Leg cut off; fall of coal. |
| 2 | William Jefferson, | do. | Turkey Run, | Collar-bone fractured. |
| 2 | Richard Stack, | do. | Hammond, | Explosion of gas; face slightly burned. |
| 5 | Paul Ratzenburg, | Driver, | William Penn, | Explosion of gas; severely burned. |
| 5 | Samuel Couch, | Miner, | do. | Explosion of gas; slightly burned. |
| 5 | Thomas Andre, | do. | do. | Explosion of gas; slightly burned. |
| 9 | William Callahan, | do. | Girard, | Arm broken. |
| 10 | John Hanley, | do. | Conner, | Arm injured. |
| 14 | Charles Bechtel, | do. | Elmwood, | Rib fractured; fall of coal. |

REGISTER OF CASUALTIES.—INJURED.—Continued.

| DATE. | Names of Persons Injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| 21 | Ernst Liebrow, . . | Loader, . . . . . | Hammond, . . . . . | Knee dislocated; fell down on gangway. |
| 24 | Nicholas Fulmore, . | Miner, . . . . . | Kohinoor, . . . . . | Leg broken; fall of coal. |
| 24 | John Brennan, . . | do. . . . . | do. . . . . | Collar-bone fractured; struck by a car. |
| 28 | Edward McGraw, . | do. . . . . | Turkey Run, . . . . . | Injured about head; struck by a piece of coal. |
| 28 | John Whitaker, . . | do. . . . . | Knickerbocker, . . . . . | Bruised about body; riding up slope. |
| 28 | William Richardson, | Fire boss, . . . . | Glendon, . . . . . | Explosion of gas. |
| 28 | John Curran, . . . | Miner, . . . . . | do. . . . . | Explosion of gas. |
| 28 | John Ryan, . . . | do. . . . . | do. . . . . | Explosion of gas. |
| June 4 | Dennis O'Brien, . . | do. . . . . | Girard, . . . . . | Coal flying from shot; leg fractured. |
| 4 | William Keil, . . . | Slate picker, . . . | Bear Run, . . . . . | Slate falling from rock chute; leg fractured. |
| 4 | James Murphy, . . | Miner, . . . . . | Gilberton, . . . . . | Explosion of gas. |
| 10 | Samuel Davis, . . . | Laborer, . . . . . | North Mahanoy, . . . . . | Fell on pick; hip hurt. |
| 11 | Thomas Cresswell, . | do. . . . . | Girard, . . . . . | Leg jammed by cars. |
| 20 | John Hackett, . . . | Miner, . . . . . | Boston Run, . . . . . | Fall of coal; leg broken and hip bruised. |
| 25 | Frederick May, . . | Laborer, . . . . . | William Penn, . . . . . | Fall of coal; leg severely cut. |
| 25 | John Groody, . . . | do. . . . . | Shenandoah City, . . . . . | Explosion of powder, while drilling out charge. |
| July 15 | Enos Ball, . . . . . | do. . . . . | Turkey Run, . . . . . | Jammed between bumpers of locomotive and cars; leg broken. |
| 21 | John Gasthener, . . | Carpenter, . . . . | Glendon, . . . . . | Fell from engine-house roof. |
| 22 | Anthony Burke, . | Laborer, . . . . . | Turkey Run, . . . . . | Coupling cars; finger cut off. |
| 26 | William McAndrew, | Miner, . . . . . | Gilberton, . . . . . | Explosion of gas; hand slightly burned. |
| 26 | Peter Foster, . . . | do. . . . . | Boston Run, . . . . . | Fall of slate; back hurt. |
| 29 | William Carey, . . | Driver, . . . . . | Lost Creek, No. 2, . . . . . | Leg broken by dirt dumper. |
| 29 | John Moran, . . . . | Miner, . . . . . | West Lehigh, . . . . . | Fall of coal; leg broken. |
| Aug. 5 | Mathias Savage, . . | do. . . . . | Shenandoah City, . . . . . | Explosion of gas; slightly burned. |
| 5 | Jacob Hilderbrand, | Driver, . . . . . | do. . . . . | Explosion of gas; slightly burned. |
| 11 | James Igo, . . . . . | Miner, . . . . . | Knickerbocker, . . . . . | Struck by piece of rock; thigh injured. |
| 11 | Thomas McGuire, . | do. . . . . | Lehigh, No. 3, . . . . . | Fall of coal; leg broken. |
| 12 | Patrick Clarke, . . | do. . . . . | Schuylkill, . . . . . | Struck by piece of coal; collar-bone fractured. |
| 13 | Fred'k Hinckey, . . | do. . . . . | West Shenandoah, . . . . . | Fall of coal; head cut and shoulder bruised. |
| 13 | John Parfet, . . . | do. . . . . | Mahanoy City, . . . . . | Fall of coal; head injured. |
| 14 | Patrick Gannon, . . | do. . . . . | Conner, . . . . . | Slip of coal from pillar; hip dislocated. |
| 19 | Thomas McGuire, . | do. . . . . | Kohinoor, . . . . . | Fall of coal; injuries serious. |
| 19 | James P. Farrell, . | do. . . . . | North Mahanoy, . . . . . | Fall of piece of coal while barring down; thigh broken. |
| 19 | Michael Nearey, . . | do. . . . . | Knickerbocker, . . . . . | Shot hung fire; returning before it exploded, it went off; hip injured. |
| 21 | Thomas Lennon, . | Driver, . . . . . | do. . . . . | Kicked by mule; leg injured. |

| | | | | |
|---|---|---|---|---|
| 21 | John Dalton, | Miner, | Turkey Run, | Struck by piece of coal; ankle and wrist injured. |
| 21 | Tim Wittle, | do. | Mahanoy City, | Fall of piece of coal; leg injured. |
| 23 | Samuel Howells, | do. | Girard, | Fell down manway; rib fractured. |
| 27 | John Skivington, | do. | Knickerbocker, | Fall of coal; bruised about body. |
| Sept. 2 | Patrick Muldowney, | Laborer, | Girard, | Fall of coal. |
| 3 | Daniel Dowling, | Miner, | Turkey Run, | Fall of coal; back injured. |
| 3 | Daniel McGuire, | Miner, | Honeybrook, No. 1, | Shoulder dislocated; rush of loose coal in chute. |
| 6 | Charles McBreen, | Laborer, | Tunnel Ridge, | Rush of loose coal; leg broken. |
| 6 | Martin Cunningham | do. | North Mahanoy, | Arm broken; fall of coal. |
| 8 | James Bradbury, | | do. | Fall of coal; legs injured. |
| 8 | Henry Whale, | | West Shenandoah, | Finger cut off; caught between car bumpers. |
| 12 | Thomas Barnett, | | Furnace, | Caught by loose coal; ribs broken. |
| 12 | James Lickie, | | Plank Ridge, | Jammed between cars; head injured. |
| 16 | Alex. Robertson, | | Draper, | Explosion of gas; slightly burnt. |
| 16 | Joshua Holt, | | North Mahanoy, | Finger cut off; caught between piece of coal and prop. |
| 25 | William Bryson, | | Turkey Run, | Fell under car; arm broken. |
| Oct. 3 | Joshua Hosler, | | Conner, | Struck by lagging; collar-bone broken. |
| 4 | Frederick Dickey, | | Turkey Run, | Caught by car wheel; foot injured. |
| 14 | Patrick Herbert, | | Conner, | Fall of coal; leg broken. |
| 21 | William Baltzer, | | Shenandoah City, | Fall of coal; leg broken. |
| 22 | John Meeker, | | Copley, | Fall of coal; leg broken. |
| Nov. 6 | Oscar Dauflayer, | | West Shenandoah, | Finger cut off. |
| 10 | John Lynch, | | North Mahanoy, | Explosion of gas; slightly burned. |
| 11 | Anthony McAndrew | | Girard, | Explosion of gas; went into heading in oppositson to orders. |
| 15 | James Mulligan, | | Turkey Run, | Fall of coal; hip and side injured. |
| 19 | George Simmonds, | | Boston Run, | Cut about face, and arm bruised; fall of coal. |
| 22 | George Armstrong, | | Knickerbocker, | Fell under dirt dumper; arm cut off. |
| 24 | Thomas Boone, | | St. Nicholas, | Fall of coal; leg broken. |
| 29 | Hugh Tobin, | | Mahanoy City, | Fall of coal; leg broken. |
| 29 | John Haydon & son, | | Glendon, | Shot blew through into heading, injuring both severely. |
| Dec. 5 | James Hayes, | Miner, | North Mahanoy, | Fall of slate; ribs fractured. |
| 5 | John Wagner, | do. | Turkey Run, | Fall of coal; collar-bone fractured. |
| 5 | James McCool, | do. | Knickerbocker, | Coal flying from shot; head cut. |
| 11 | Charles Palmer, | do. | William Penn, | Explosion of gas; slightly burned. |
| 12 | Michael Hogen, | do. | Draper, | Explosion of gas; slightly burned. |
| 12 | Patrick Brennan, | do. | do. | Explosion of gas; slightly burned. |
| 12 | Stephen Ryan, | do. | West Lehigh, | Explosion of gas; slightly burned. |
| 13 | John Skeath, | do. | Boston Run, | Fall of coal; head cut. |
| 17 | Isaac Perry, | do. | Glendon, | Fall of coal; hips injured. |
| 18 | David Evans, | do. | Girard, | Coal flying from shot; leg fractured. |

**Recapitulation and Classification of Fatal Casualties for Shenandoah Division.**

| | |
|---|---|
| Explosions of gas, | 3 |
| Explosions of powder and blasts, | 3 |
| Falls of coal, slate, &c., | 15 |
| Mine cars, | 4 |
| Railroad cars on surface, | 2 |
| Miscellaneous, | 7 |
| Total, | 34 |

**Recapitulation and Classification of Casualties Resulting in Death.**

| | |
|---|---|
| Falls of coal, slate, &c., | 6 |
| Mine cars, | 1 |
| Railroad cars on surface, | 1 |
| Miscellaneous, | 1 |
| Total, | 9 |
| Total fatal casualties, | 43 |

**Recapitulation and Classification of Non-Fatal Casualties.**

| | |
|---|---|
| Explosions of gas, | 18 |
| Explosions of powder and blasts, | 7 |
| Falls of coal, slate, &c., | 40 |
| Mine cars, | 14 |
| Miscellaneous, | 32 |
| Total, | 111 |
| Total fatal and non-fatal casualties, | 154 |

**Comparative Statement for Five Years, of Casualties, Ratio to Coal Produced, Number of Employees, &c.**

| Years. | Killed. | Injured. | Total. | Total number employés. | Total number tons mined. | Ratio of employés to each casualty. | Tons of coal mined to each life lost. | Tons of coal to each employé injured. | Tons of coal to each casualty. |
|---|---|---|---|---|---|---|---|---|---|
| 1875, | 26 | 114 | 140 | 10,403 | 2,562,345 | $74\frac{43}{140}$ | 98,551 | 22,476.14 | 18,302.09 |
| 1876, | 27 | 48 | 75 | 10,218 | 2,891,117 | $136\frac{18}{75}$ | 107,078 | 60,210.15 | 38,548.04 |
| 1877, | 33 | 54 | 87 | 10,537 | 3,805,467 | $121\frac{10}{87}$ | 115,317 | 70,471.12 | 43,741.00 |
| 1878, | 26 | 89 | 115 | 10,255 | 3,049,275 | $89\frac{20}{115}$ | 117,279.16 | 34,261.10 | 26,515.08 |
| 1879, | 43 | 111 | 154 | 11,080 | 4,386,966 | 72 | 102,022.10 | 39,522.05 | 28,486.16 |
| Totals, | 155 | 416 | 571 | 52,493 | 16,695,173 | | | | |
| Averages, | 31 | $83\frac{1}{5}$ | $114\frac{1}{5}$ | $10,498\frac{3}{5}$ | 3,339,034.12 | $98\frac{7}{25}$ | 108,049.13 | 45,388.11 | 31,118.15 |

**Names of Collieries in Operation in the Mining District of Schuylkill, Shenandoah, or Second District, during the five years ending December 31, A. D. 1879.**

| Number and Names of the Collieries. | Location of Collieries. | Names of Operators. | Class of Collieries. | Coal Produced. | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1875. | 1876. | 1877. | 1878. | 1879. |
| William Penn, | West Mahanoy twp., | William Penn Coal Company, | Shaft, | 107,640.00 | 124,000.00 | 164,476.00 | 123,000.00 | 178,445.06 |
| Lehigh, No. 3, | do. do. | Philadelphia Coal Company, | Slope, | 88,581.00 | 80,747.00 | 117,165.00 | 83,852.00 | 111,487.03 |
| Packer, No. 4, | do. do. | do. do. do. | do. | | | 101,860.00 | 118,677.00 | 248,341.18 |
| Shenandoah, No. 2, | do. do. | do. do. do. | do. | 63,995.00 | 118,118.00 | 88,830.00 | 88,411.00 | 144,138.01 |
| Colorado, No. 1, | do. do. | do. do. do. | do. | 46,803.00 | 63,871.00 | 85,955.00 | 62,181.00 | 85,297.03 |
| Hammond, | Girardsville, | Philadelphia and Reading C. and I. Co., | do. | 88,610.00 | 104,652.00 | 121,416.00 | 102,000.00 | 116,585.17 |
| Conner, | do. | do. do. do. | Water levels, | | | 103,639.00 | 83,000.00 | 133,472.13 |
| Girard, | do. | do. do. do. | Slopes, | 39,371.00 | 51,290.00 | 95,043.00 | 73,000.00 | 107,877.10 |
| Bear Ridge, No. 1, | Mahanoy Plane, | Bear Ridge Coal Company, | do. | 87,876.00 | 100,000.00 | 23,517.00 | 44,520.00 | 89,333.08 |
| Bear Ridge, No. 2, | do. | do. do. | Tunnel, | | | 84,976.00 | 51,144.00 | 30,036.18 |
| Thomas, or Kehley Run, Nos. 1 and 2, | Shenandoah, | Thomas Coal Company, | Slopes, | 66,467.00 | 94,862.00 | 63,905.00 | 100,358.00 | 151,266.11 |
| Kohinoor, | do. | R. Heeksher & Co., | Shaft, | 95,638.00 | 90,000.00 | 162,027.00 | 110,893.00 | 161,844.19 |
| Gilberton, | Gilberton, | Philadelphia and Reading C. and I. Co., | Slope, | 50,437.00 | 91,691.00 | 87,832.00 | 58,842.00 | 59,014.16 |
| Draper, | do. | | do. | 57,042.00 | 45,000.00 | 108,344.00 | 55,813.00 | 108,000.00 |
| Stanton, | do. | Miller, Hoch & Co., | do. | 61,792.00 | 60,000.00 | 78,289.00 | 74,623.00 | 97,136.16 |
| Lawrence, | do. | Lawrence, Merkle & Co., | do. | 67,417.00 | 85,000.00 | 99,547.00 | 70,578.00 | 102,000.00 |
| Turkey Run, | Shenandoah, | Philadelphia and Reading C. and I. Co., | Inside slopes, | 61,359.00 | 62,000.00 | 60,529.00 | 71,997.00 | 95,179.06 |
| Furnace, | Gilberton, | do. do. do. | Slope, | 62,421.00 | 14,296.00 | 4,458.00 | 15,000.00 | 40,821.07 |
| Cambridge, | Shenandoah, | | Drift, | | 5,000.00 | 2,862.00 | 5,000.00 | 2,197.00 |
| Roanoke, | do. | | | | 4,000.00 | | 5,000.00 | |
| West Shenandoah, | do. | Philadelphia and Reading C. and I. Co., | Slope, | 30,069.00 | 64,309.00 | 100,762.00 | 69,000.00 | 122,507.16 |
| Cuyler, | Raven Run, | Heaton & Bros., | Inside slope and water level, | 52,751.00 | 65,000.00 | 55,570.00 | 78,722.00 | 126,291.00 |
| Girard Mammoth, | do. | | Inside slope and water level, | 39,407.00 | 55,000.00 | 34,608.00 | 54,723.00 | 35,000.00 |
| East Gilberton, | Gilberton, | Peter Malley & Co., | Crop of 7 foot, | | | | 4,000.00 | 5,000.00 |
| East Stanton, | do. | John Dutter, | do. do. | | | | 1,000.00 | 13,000.00 |
| Indian Ridge, | Shenandoah, | Philadelphia and Reading C. and I. Co., | Shaft, | 98,569.00 | 112,213.00 | 155,131.00 | 122,000.00 | 173,517.09 |
| Plank Ridge, | do. | do. do. do. | do. | 81,737.00 | 103,074.00 | 118,819.00 | 80,000.00 | 122,424.10 |
| Knickerboeker, | Yatesville, | do. do. do. | do. | 64,593.00 | 113,985.00 | 133,123.00 | 105,000.00 | 174,665.10 |
| Ellangowan, | Lanigan's, | do. do. do. | do. | 53,984.00 | 91,884.00 | 145,866.00 | 2,000.00 | 17,242.13 |
| Boston Run, | Boston Run, | do. do. do. | Slope, | 39,084.00 | 53,151.00 | 68,598.00 | 6,000.00 | 73,489.16 |
| Elmwood, | Mahanoy City, | do. do. do. | do. | 25,740.00 | 41,211.00 | 65,260.00 | 56,000.00 | 78,333.16 |
| Mahanoy City, | do. | do. do. do. | do. | 51,402.00 | 73,363.00 | 117,293.00 | 86,000.00 | 126,171.01 |
| North Mahanoy, | do. | do. do. do. | do. | 40,080.00 | 53,217.00 | 86,886.00 | 70,000.00 | 113,878.02 |
| Schuylkill, | do. | do. do. do. | Shaft, | 13,501.00 | 58,553.00 | 21,058.00 | 35,000.00 | 49,661.01 |
| Shenandoah City, | Shenandoah, | do. do. do. | Slope, | 67,850.00 | 53,299.00 | 47,403.00 | 35,000.00 | 69,522.05 |
| St. Nicholas, | St. Nicholas, | St. Nicholas Coal Company, | do. | 47,338.00 | 55,876.00 | 92,483.00 | 63,134.00 | 78,602.02 |
| Bear Run, | do. | Philadelphia and Reading C. and I. Co., | do. | 57,411.00 | 61,651.00 | 82,409.00 | 57,674.00 | 63,044.08 |
| Suffolk, | do. | Suffolk Coal Company, | do. | 23,245.00 | 46,680.00 | 66,181.00 | 64,459.00 | 85,451.01 |
| Staffordshire, | Mahanoy City, | Jones, Ward & Oliver, | Water level, | | 7,458.00 | 8,265.00 | 9,000.00 | 13,447.06 |
| North Star, | do. | Reynolds & Roberts, | do. | | 8,111.00 | 1,504.00 | 7,000.00 | 11,493.11 |

**Collieries in Operation—Continued.**

| Number and Names of the Collieries. | Location of Collieries. | Names of Operators. | Class of Collieries. | Coal Produced. | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1875. | 1876. | 1877. | 1878. | 1879. |
| Harford, (Webster,) | Mahanoy City, | King, Tyler & Co., now Conrad & Cowley, | Water level, | 1,000.00 | 6,290.00 | 553.00 | ..... | 2,810.12 |
| Honey Brook, No. 1, | Audenried, | E. B. Leisenring, | Slope, | 55,637.00 | 99,071.00 | 102,781.00 | 62,454.00 | 89,059.01 |
| Honey Brook, No. 4, | do. | do. | do. | 51,729.00 | 88,449.00 | 101,281.00 | 64,243.00 | 95,298.08 |
| Honey Brook, No. 5, | do. | do. | do. | 85,229.00 | 124,088.00 | 132,869.00 | 96,535.00 | 119,917.09 |
| Tunnel Ridge, | Mahanoy City, | Philadelphia and Reading C. and I. Co., | do. | 56,901.00 | 44,132.00 | 30,340.00 | 38,851.00 | 64,953.09 |
| Coplay, | do. | Lentz & Bowman, | Shaft and drift, | 66,856.00 | 48,111.00 | 28,211.00 | 46,374.00 | 42,068.08 |
| Glendon, | do. | J. C. Hayden & Co., | Slope, | 67,969.00 | 15,060.00 | 41,212.00 | 42,139.00 | 52,132.11 |
| West Lehigh, | do. | Fisher & Hazzard, | do. | 13,551.00 | 70,144.00 | 23,405.00 | 33,333.00 | 18,553.16 |
| Primrose, | do. | ..... | do. | 54,776.00 | 57,350.00 | 50,573.00 | 41,447.00 | 38,660.01 |
| Vulcan, | do. | ..... | Abandoned, | 26,266.00 | 38,216.00 | 6,356.00 | 16,565.00 | |
| Morris, | do. | Parmley and Russel, | Water level, | 24,378.00 | 7,705.00 | 3,583.00 | 6,788.00 | 233.00 |
| Total tons of coal shipped to market, | | | | 2,562,345.00 | 2,740,117.00 | 3,590,064.00 | 2,841,774.00 | 4,138,706.17 |
| Total tons of coal consumed locally, | | | | ..... | 151,000.00 | 215,403.00 | 200,000.00 | 248,262.03 |
| Total tons of coal mined, | | | | 2,562,345.00 | 2,891,117.00 | 3,805,467.00 | 3,041,774.00 | 4,386,969.00 |

**Report of Ventilation, Employees, Coal Mined, Days Worked, &c.,**

| COLLIERIES. | OPERATORS. | INSIDE. | | | | | | OUTSIDE. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number inside bosses. | Number miners. | Number laborers and company men | Number drivers. | Number door boys. | Total. | Number bosses and mechanics. | Number laborers and company men. | Number drivers and slate pickers. | Total. |
| Boston Run, | Philad. and Reading C. & I. Co., | 2 | 62 | 48 | . . | 2 | 114 | 9 | 31 | 74 | 114 |
| Bear Run, | do. do. | 2 | 153 | 37 | 7 | 3 | 102 | 11 | 34 | 82 | 127 |
| Conner, | do. do. | 1 | 18 | 36 | 18 | 8 | 181 | 9 | 38 | 82 | 129 |
| Ellangowan, | do. do. | . . | 51 | 32 | 6 | . | 89 | 8 | 9 | 4 | 21 |
| Elmwood, | do. do. | 1 | 55 | 30 | 9 | 6 | 101 | 8 | 16 | 52 | 76 |
| Furnace, | do. do. | 1 | 42 | 20 | 4 | 2 | 69 | 9 | 20 | 30 | 59 |
| Girard, | do. do. | 4 | 55 | 56 | 10 | 5 | 130 | 10 | 36 | 88 | 134 |
| Girard Mammoth, | do. do. | 2 | 50 | 45 | 8 | 15 | 120 | 10 | 20 | 44 | 74 |
| Gilberton, | do. do. | 2 | 27 | 27 | 6 | 3 | 65 | 12 | 36 | 61 | 109 |
| Hammond, | do. do. | 3 | 51 | 47 | 10 | 2 | 113 | 10 | 39 | 79 | 128 |
| Indian Ridge, | do. do. | 2 | 149 | 72 | 25 | 12 | 260 | 13 | 48 | 154 | 215 |
| Knickerboeker, | do. do. | 1 | 89 | 44 | 9 | 5 | 148 | 11 | 43 | 111 | 165 |
| Mahanoy City, | do. do. | 2 | 99 | 45 | 16 | 6 | 168 | 10 | 26 | 101 | 137 |
| Mahanoy North, | do. do. | 1 | 117 | 41 | 10 | 6 | 175 | 9 | 20 | 82 | 111 |
| Plank Ridge, | do. do. | 3 | 166 | 26 | 16 | 15 | 226 | 11 | 37 | 89 | 137 |
| Schuylkill, | do. do. | . . | 33 | 16 | 9 | 3 | 61 | 9 | 12 | 39 | 60 |
| Turkey Run, | do. do. | 1 | 99 | 47 | 12 | 7 | 166 | 12 | 28 | 73 | 113 |
| Tunnel Ridge, | do. do. | 2 | 58 | 26 | 5 | 1 | 92 | 8 | 20 | 80 | 108 |
| West Shenandoah, | do. do. | 2 | 107 | 27 | 15 | 9 | 160 | 12 | 42 | 104 | 158 |
| Bear Ridge, No. 1, | Bear Ridge Coal Company, | . | 32 | 38 | 6 | 4 | 80 | 11 | 33 | 77 | 121 |
| Bear Ridge, No. 2, | do. do. | 1 | 33 | 47 | 5 | 5 | 91 | 9 | 22 | 81 | 112 |
| Colorado, No. 1, | Philadelphia Coal Company, | 2 | 73 | 63 | 6 | 3 | 147 | 11 | 46 | 126 | 183 |
| Shenandoah, No. 2, | do. | | 78 | 75 | 4 | . . | 157 | 6 | 63 | 106 | 175 |
| Lehigh, No. 3, | do. | . . | 67 | 102 | 6 | 6 | 181 | 10 | 56 | 98 | 164 |
| Packer, No. 4, | do. | | 206 | 97 | 4 | 4 | 311 | 15 | 46 | 111 | 172 |
| Cambridge, | Cambridge Coal Company, | | 12 | . . | 2 | . . | 14 | 1 | 6 | 4 | 11 |
| Cuyler, | Heaton & Bros., | 1 | 128 | 11 | 15 | 5 | 160 | 8 | 38 | 109 | 155 |
| Copley, | Lutz & Bowman, | . . | 85 | 18 | 13 | 2 | 118 | 2 | 16 | 54 | 72 |
| Draper, | . . . . . | . . | 48 | 34 | 8 | 4 | 94 | 12 | 41 | 58 | 111 |
| Glendon, | J. C. Hayden & Co., | . . | 66 | 45 | 8 | 15 | 134 | 10 | 20 | 44 | 74 |
| Harford, (Webster,) | Conrad & Cowley, | . . | 14 | 4 | 2 | . . | 20 | 1 | 7 | 12 | 20 |
| Honey Brook, No. 1, | E. B. Leisenring, | 2 | 69 | 88 | 17 | 5 | 181 | 10 | 40 | 65 | 115 |
| Honey Brook, No. 4, | do. | . | 56 | 52 | 17 | 13 | 138 | 6 | 28 | 82 | 116 |
| Honey Brook, No. 5, | do. | 1 | 56 | 65 | 12 | 7 | 141 | 12 | 55 | 64 | 131 |
| Koh-i-noor, | R. Heckscher & Co., | 3 | 150 | 33 | 21 | 12 | 219 | 10 | 24 | 106 | 140 |
| Lawrence, | Lawrence, Merkle & Co., | 1 | 48 | 33 | 11 | 5 | 98 | 6 | 8 | 65 | 79 |
| North Star, (Hartford,) | Roberts & Reynolds, | 1 | 35 | 3 | 2 | . . | 41 | 3 | 5 | 12 | 20 |
| Primrose, | Primrose Coal Company, | 1 | 60 | 11 | 8 | 4 | 84 | 6 | 17 | 30 | 53 |
| Stanton, | Miller, Hoch & Co., | 1 | 24 | 41 | 7 | 7 | 80 | 12 | 30 | 120 | 162 |
| St Nicholas, | St. Nicholas Coal Company, | 1 | 50 | 43 | 5 | 13 | 112 | 8 | 33 | 67 | 108 |
| Suffolk, | Suffolk Coal Company, | 1 | 92 | 25 | 8 | 3 | 129 | 11 | 37 | 72 | 120 |
| Staffordshire, | Ward, Jones & Oliver, | | 23 | 1 | 2 | . . | 26 | 1 | 3 | 4 | 8 |
| Thomas, (Kehley Run,) | Thomas Coal Company, | 2 | 111 | 75 | 8 | 11 | 207 | 8 | 61 | 175 | 244 |
| Wm. Penn, | Wm. Penn Coal Company, | 2 | 46 | 26 | 12 | 12 | 98 | 8 | 100 | 100 | 208 |
| West Lehigh, | Fisher, Hazzard & Co., | . . | . . | . . | . . | . . | 120 | . . | . . | . . | 90 |
| Morris | Parmley & Russel, | . . | . | . . | . | . | . . . | . . | . . | . . | . . . |
| Shenandoah City, | Philad. and Reading C. & I. Co., | 1 | 72 | 40 | 13 | 11 | 137 | 10 | 24 | 49 | 83 |
| East Stanton, | John Dutter, | . | . . | . . | . . | . . | . . . | . . | . . | . . | . . . |
| East Gilberton, | Peter Malley & Co., | . . | . . | . | . . | . | . . . | . . | . . | . . | . . . |
| | Totals, | . . | . . | . . | . | . . | 5,858 | . . | . . | . . | 5,222 |

for year ending December 31, 1879.

| Gross total. | Number mules and horses. | Number locomotives inside | Number of kegs of powder used. | Number days worked by breaker. | VENTILATION. | | | Seams worked. | Number persons killed. | Number persons injured | Number tons of coal shipped. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Diameter fan. | Power. | Revolutions per minute. | | | | |
| 228 | 19 | . . | 2,575 | 223 | 18 | 40 | 60 | Mammoth, . . . . . | 2 | 5 | 73,489.16 |
| 229 | 21 | . . . | 1,250 | 167 | 16 | 20 | 80 | Mammoth and Holmes, . . | 1 | 1 | 63,044.08 |
| 310 | 41 | . . . | 2,975 | 258 | 8 | 110 | 120 | Buck Mountain, . . . . . | 1 | 5 | 133,472.13 |
| 110 | 21 | 1 | 2,140 | 15 | 20 | 80 | 40 | Mammoth and Primrose, . | . . . | . | 17,242.13 |
| 177 | 13 | . . . | 1,735 | 242 | 14 | 20 | 80 | Buck Mountain, . . . . . | . . . | 7 | 78,333.16 |
| 128 | 7 | 1 | 870 | 135 | 12 | 20 | 80 | Mammoth, . . . . . | 1 | 1 | 40,821.07 |
| 264 | 30 | . | 1,415 | 254 | 12 | 15 | 80 | do. | . . . | 8 | 107,877.10 |
| 194 | 21 | 1 | . . | . . | 12 | 25 | 100 | do. | . . . | . . . | 35,000.00 |
| 174 | 16 | . . | 550 | 174 | . . | . . | . . | do. | . . . | 2 | 59,014.16 |
| 241 | 23 | 1 | 1,175 | 250 | 16 | 30 | 95 | do. | 1 | 4 | 116,585.17 |
| 475 | 39 | 1 | 3,982 | 261 | 18 | 40 | 90 | do. | . . . | 1 | 173,5 7.09 |
| 313 | 24 | . . | 4,952 | 262 | 15 | 40 | 80 | do. | 1 | 9 | 174,665.10 |
| 305 | 33 | . . | 3,215 | 264 | 2-14 | 20 | 100 | Mammoth and Primrose, . | 1 | 4 | 126,171.04 |
| | | | | | 14 | 15 | 85 | | | | |
| 286 | 17 | . . . | 3,280 | 268 | 15 | 30 | 80 | Buck Mt., 7 foot, Skidmore, | . . . | 7 | 113,678.02 |
| 363 | 38 | . | 6,510 | 266 | 15 | 30 | 80 | do. do. | 3 | 2 | 122,424.10 |
| 121 | 13 | . . . | 990 | 200 | 15 | 30 | 75 | do. do. | 2 | 2 | 49,661.01 |
| 279 | 23 | 1 | 2,125 | 185 | 14 | 15 | 90 | Mammoth, . . . . | 2 | 10 | 95,179.06 |
| 200 | 24 | . . . | 1,000 | 200 | 10 | 10 | 80 | Mammoth 7 foot, Buck Mt., | . . | 1 | 64,953.09 |
| 318 | 22 | . . . | 2,900 | 260 | 12 | 15 | 80 | do. do. | 2 | 5 | 122,507.16 |
| 201 | 10 | . . . | 1,300 | 250 | 14 | 25 | 100 | Mammoth, . . . . . | 2 | . . . | 89,333.08 |
| 203 | 12 | 1 | . . . . | 105 | 12 | 25 | 80 | do. | . . | . . | 30,036.18 |
| 330 | 13 | . . . | 1,697 | 185 | 12 | 30 | 100 | do. | . . . | . . . | 85,297.03 |
| 332 | 8 | 2 | 2,271 | 268 | 12 | 40 | 120 | do. | . . . | . | 144,138.01 |
| 345 | 10 | 1 | 1,674 | 232 | 15 | 40 | 120 | do. | 4 | 2 | 111,487.03 |
| 483 | 8 | 1 | 5,376 | 280 | 12 | 20 | 120 | do. | 3 | 1 | 248,341.18 |
| 25 | 3 | . . . | 85 | 100 | . . . | . | . . | Primrose, . . . . . | . . . | . . | 2,197.00 |
| 315 | 35 | 2 | 3,875 | 215 | 15 | 30 | 100 | Buck Mountain, . . . . | . . . | 3 | 126,291.00 |
| 190 | 32 | . . . | 983 | 141 | 12 | 25 | 80 | do. | . . . | 1 | 42,068.08 |
| 205 | 24 | . . | 1,300 | 254 | 16 | 30 | 90 | do. | . . . | 3 | 108,000.00 |
| 208 | 21 | . . . | 1,390 | 122 | 14 | 15 | 90 | Buck Mt., 7 foot, Skidmore, | 3 | 6 | 52,132.11 |
| 40 | 6 | . . . | 121 | 46 | natu | ral. | . . | do. do. | . . . | | 2,810.12 |
| 296 | 30 | . . | 1,706 | 188 | . . . | . | . . . | Mammoth and Skidmore, . | 1 | 1 | 89,059.01 |
| 254 | 29 | . . . | 1,423 | 188 | . . . | . . | . . . | do. | . . . | . . | 95,298.08 |
| 272 | 26 | . . . | 1,033 | 194 | . . | | | do. | | . | 119,917.09 |
| 359 | 34 | . . . | 2,675 | 235 | 16 | 30 | 85 | Mammoth, . . . | 3 | 3 | 161,844.19 |
| 177 | 23 | . . | 1,200 | 240 | 2-14 | 20 | 100 | Mammoth and Primrose, . | . . . | 1 | 102,000.00 |
| | | | | | 15 | 30 | 80 | | | | |
| 61 | 4 | . . . | 590 | 140 | 8 | 10 | 100 | Seven foot and Skidmore, . | . | . . | 11,493.11 |
| 137 | 13 | . . . | 719 | 152 | 14 | 15 | 80 | Mammoth and Primrose, . | . . | . | 38,660.01 |
| 242 | 24 | . . . | 779 | 251 | 14 | 15 | 85 | do. | 1 | . . | 97,136.16 |
| 220 | 23 | . . | 2,400 | 203 | 2-12 | 20 | 90 | Mammoth, Holmes, Buck Mt | 1 | 2 | 78,602.02 |
| | | | | | 14 | 15 | 80 | | | | |
| 249 | 17 | 1 | 2,181 | 234 | 18 | 25 | 80 | Primrose and Tracey, . . | 2 | 1 | 85,451.01 |
| 34 | 3 | . . . | 300 | 184 | natu | ral. | . | Do not know, . . . . . | . . . | . . . | 13,447.06 |
| 451 | 28 | 3 | 2,795 | 247 | 14 | 15 | 80 | Mammoth, 7 foot, Buck Mt., | | . . . | 151,266.11 |
| 306 | 30 | . . . | 2,500 | 240 | 3-7 | 10 | 150 | Mammoth and Holmes, . | 2 | 8 | 178,445.06 |
| | | | | | 12 | 20 | 110 | | | | |
| | | | | | 16 | 30 | 90 | | | | |
| 210 | 20 | . . . | 500 | 120 | 14 | 20 | 90 | Buck Mt., 7 foot, Skidmore, | . . . | 3 | 18,553.16 |
| . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . . . | . . . | . . . | 233.00 |
| 220 | 22 | . . | 2,125 | 239 | 14 | 20 | . . | Mammoth, . . . . . | 1 | 6 | 69,522.05 |
| . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . . . | . . . | . . . | 13,000.00 |
| . . . | . . . | . . | . . . | . . | . . | . . . | . . | . . . . . | . | . . | 5,000.00 |
| 11,080 | 953 | 17 | 86,637 | 213 | . . . | . . . | . . . | . . . . . | 43 | 111 | 4,138,706,17 |

| | |
|---|---|
| Add six per cent. for consumption at mines, . . . . . | 248,262.03 |
| Total tons of coal produced, . . . . . | 4,386,969.00 |

# THIRD OR SHAMOKIN DISTRICT.

OFFICE OF INSPECTOR OF MINES, SHAMOKIN DISTRICT,
ASHLAND, *March 8, 1880.*

To His Excellency HENRY M. HOYT,
*Governor of Pennsylvania:*

DEAR SIR: In compliance with the act of Assembly pertaining to ventilation of mines, I herewith have the honor of submitting the accompanying annual report of proceedings, accidents, state of the workings, with tabulated statements of employés, tonnage, &c., for the year 1879.

| | |
|---|---|
| The total quantity of coal shipped to market and sold at collieries, | 3,720,603.16 |
| Estimated amount used at collieries, | 95,519.00 |
| Total out-put, | 3,816,122 16 |
| Fatal accidents, | 46 |
| Non-fatal accidents, | 103 |
| Total for year, | 149 |

One hundred and eighty-nine visits were made to collieries to inspect their workings, and thirty-six inquests were attended.

| | |
|---|---|
| Traveled, in performance of above duties, by rail, | 5,064 miles. |
| Traveled, in performance of above duties, on foot, outside, | 568 " |
| Traveled, in performance of above duties, on foot, in mines, | 556 " |
| Total, | 6,188 miles. |

In addition to tabulated statements, I have given my views of the causes of accidents, under their several classifications, and offered such suggestions as experience has shown would tend to lessen their number, with articles on other subjects that I deemed of importance to those interested or engaged in the mining of coal.

The collieries of the district, with some four or five exceptions, are in

fair condition, both as to ventilation and general safety; and prepared, if the market will warrant it, to materially increase their shipments over that of the past year.

Respectfully, your obedient servant,

JAMES RYAN,
*Inspector.*

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### IMPROVEMENTS.

#### Tunnel Colliery.

The hoisting and pump slopes have been each sunk one hundred and three and a third yards from old lift, on the "F," or Holmes vein, on an angle of 72°, preparatory to tunneling south to the "E," or Mammoth vein.

#### Wadleigh.

Slope sunk from bottom of old slope one hundred and twenty-four yards, on an angle varying from 40° to 47°. Work is now progressing driving an air-hole, which, when completed, a fan will be placed upon it to ventilate the west gangway and openings which is proposed to be driven to connect with the east gangway of the Potts colliery.

#### Pennsylvania.

This is the colliery reported last year as Green Ridge, page 76, then sinking trial slope. Slope has been sunk on the north dip of the No. 9 Twin veins, three hundred yards, on an angle of 34½°. East, west, lower, and counter gangways have been driven. A new breaker has been built, and two miles of railroad. Commenced shipping coal the latter part of the year. All indications point to this being a valuable colliery.

#### Carson.

A slope has been sunk on the north dip of the Diamond or No. 12 vein, to the basin, to a depth of one hundred and three yards, on an angle of 65°, in five feet of coal. Gangways are now being driven.

#### Stirling.

A "lift," of one hundred yards, on an angle of from 24½° to 31°, on the north dip of the No. 9 (Twin) vein, has been sunk. East and west gangways are now being driven.

#### Peerless.

A slope has been sunk on the south dip of the Pink Ash, or No. 13 vein, one hundred and fifty yards, on an angle varying from 44° to 47°. Machinery for hoisting coal has been erected, and preparations being made for increased shipments during year 1880.

#### Monroe.

Located on the western limits of Montana, Columbia county, and operated by A. H. Church. New slope has been sunk on the south dip of the "E," or Mammoth vein, one hundred and eleven yards, on an angle of 60°

**Black Diamond.**

Slope has been sunk a "lift" of seventy yards, on the north dip of the No. 8 (Twin) vein.

**Stewartsville.**

An inside rock and slate slope has been sunk across the measures, from the Mammoth to the Skidmore vein, fifty yards. New air-shaft has been driven, and a pair of hoisting engines has been erected, with other necessary machinery for hoisting coal.

**Glen City.**

A new slope has been sunk, on the south dip of the Buck Mountain vein, eighty-seven yards, on an angle of 50°, with the necessary machinery erected to hoist coal.

**Centralia.**

The breaker connected with this colliery was burned down on July 15. A new slope has been sunk to water-level, on Skidmore vein, with the design of continuing the same one hundred and twenty yards further. Suitable machinery to operate this colliery is now being erected. It is proposed to commence erecting new breaker in the spring of 1880.

Mr George Troutman has sunk a new slope one hundred and ten yards, on the north dip of the "E" or Mammoth vein, on an angle of 27°, in the Mount Carmel basin, on lands of the Locust Mountain Coal and Iron Company. Boilers, hoisting, and other machinery are being erected. A breaker is to be built in the spring of 1880.

**West Brookside Colliery.**

Located north of Tower City, Porter township, Schuylkill county, on the lands of the Philadelphia and Reading Coal and Iron Company, and by them operated. A view of the breakers, and surroundings is herewith attached.

This colliery was opened in 1868, by Savage & Kauffman, who were succeeded by George S. Repplier, and he by the Philadelphia and Reading Coal and Iron Company, the present owners.

The seam or vein of coal worked, is known as the Lykens Valley, which, in this mine, averages from eight to thirteen feet of solid coal, flat workings; it is a hard red ash, a superior free burning coal, unexcelled for domestic use.

The surface openings consist of one tunnel, and two slopes; a third slope is being now sunk, and will be in operation by early spring.

The inside or underground openings comprise two slopes, six planes, and seven main gangways, a total length of track inside of $10\frac{1730}{5280}$ miles, outside tracks, 4,800 feet in length, or inside and ouside, total of $11\frac{2250}{5280}$ miles. That the extent of the underground workings may be more fully shown, a map is hereto attached, specially made for this report.

every occasion, by the defendants.

The shipment of tons of coal to market for 1879, was, . 410,815.09
Estimated local consumption, . . . . . 24,640.11

Total for year, . . . . . 435,463.00

Total production for five years, . . . . . 1,382,083.00 tons,

Being the largest production of coal of any colliery in either the United States or Europe, so far as we have any knowledge or information.

Two breakers are used in the preparation of the coal mined. Fifteen engines of about four hundred and fifty horse power, with twenty-six boilers. Ventilation is furnished by two fans; a third fan is erected but not required, as the two fans supply an ample amount of air throughout all the workings.

The general condition of the workings and machinery is excellent, as is in fact, with scarcely an exception, all the collieries operated by this company in my district.

There were four lives lost; two of these were boys on the surface, and six seriously injured during the year. A ratio of one life lost to 108,866 tons of coal produced; a ratio of one person injured to 68,496$\frac{1}{6}$ tons of coal produced, and a ratio of one life lost to one hundred and seventy-one employés.

The slate overlaying the seam of coal, in some portions of the mine is of a "slippy," dangerous character, and to avoid frequent accidents, requires more than ordinary care and supervision, which it is evident exists in this colliery, as judged from the casualties. The two lives lost, and one injured underground being caused by falls.

A detailed description of the underground workings, were given in report for 1878, page 84.

**Legal Proceedings.**

In two cases I was forced to resort to proceedings at law, in order to secure compliance with the provisions of the act. The Henry Clay colliery, of J. Langdon & Co., and the Locust Gap colliery, of Graeber & Shepp, were being worked in violation of the provisions of the law requiring an adequate amount of ventilation to be maintained. Bills in equity were filed, and applications made for injunctions. The defendants very strenuously resisted the granting of the injunctions. They produced the affidavits of large numbers of the men, that the ventilation was good, though it was very clear that it was not up to the requirements of the law.

The Court was required to procure the service of an expert to make an examination, and upon his report the Court granted an injunction against Langdon & Co., and directed that they pay the costs; in the other case, the Court declined to grant the injunction, as, after the date of the filing of the bill, the defendants, Graeber & Shepp, had very considerably improved the ventilation, but directed that they pay the costs.

The cases were argued several times, and much time necessarily consumed in the proceedings, large numbers of affidavits being furnished on every occasion, by the defendants.

The act is defective, in not furnishing a more prompt remedy than by proceedings in equity. The value of the law consists in its prompt enforcement, and delay renders the proceedings instituted of very little practical benefit to those whom it was the design of the law to protect.

The Court expressed a firm purpose to maintain and to strictly enforce all the provisions of the law designed to secure the safety and health of the persons employed in the mines.

This action of the Court has produced a most salutary effect, and hope that the example that has been furnished, that the law is capable of being enforced through the aid of judicial process, will be so thoroughly accepted as to seldom make it necessary for the inspector to resort to such means.

#### Ventilation.

It is gratifying to be enabled to state that there has been a decided improvement in the ventilation of collieries in this district, during the past year, although not so general as desirable.

The Philadelphia and Reading Coal and Iron Company have erected two new fans, and William Montelius one, as follows:

One at Merriam colliery; diameter, eighteen feet; Philadelphia and Reading Coal and Iron Company.

One at Preston, No. 2, colliery; diameter, fifteen feet; Philadelphia and Reading Coal and Iron Company.

One at Stewartsville colliery; diameter, twelve feet; William Montelius.

Three have been remodeled, two that had open peripheries were inclosed, and the third improved by re-covering or inclosing it.

Among the indispensable requisites necessary to an intelligent working of a mine, there is not any of such vital importance as that of ventilation, nor are there any less understood. There are many men employed as inside foremen, upon whose intelligence and knowledge of this subject depend the safety and life of every person employed within the mine, yet whose incompetence for the position is only excelled by the daring recklessness in accepting its responsibilities, "where angels fear to tread."

Operators or owners are unmindful of their best interests when they employ foremen that are not fully competent for the position. No matter how good or valuable the vein or seam of coal, if not worked intelligently, and with a due regard to safety and health of miners, it must entail loss, and decrease the profits that must otherwise accrue.

The importance of having a perfect knowledge of the laws governing ventilation, the most approved modes for the proper distribution of pure air throughout the mine, in all its working places, in sufficient quantity, is a factor of no little importance, when taking into consideration the increased amount of labor that can be performed in a given time, the health and safety of those employed, and the vast expense saved by exemption from the consequences of impure or insufficient air in fatal or serious accidents or injury to the mine workings by explosions of gas.

When a strong air current is passing the face of working places, carrying off all noxious gases emitted by the coal, lamps, breathing, and the smoke of powder in blasting quickly, the miners are much more able and willing to do a good day's work, than they are when working in vitiated air. In carrying off the smoke from blasts quickly, it enables the miner to save time in the return to his working place, a greater degree of safety as well as prudence in the examination and detection of loose and dangerous coal, bad or unsafe roof, and freedom from the many dangers existing in the breast or working place, when enveloped in clouds of smoke.

Frequently when objecting to the insufficiency of air in a mine to the foreman or superintendant, and demanding improvement, I am met with the response, "the miners do not complain of bad air," and this in mines where there was not sufficient air current in the inlet or intake to move the anemometer. It is true, the men may not or do not complain to those in charge of the want of sufficient air or the impurity existing in that they inhale, for reasons well understood. But that is not the slightest evidence that the necessary amount of air is supplied, nor does it by any means exonerate the foreman, superintendent, or operator. It is their duty to supply, in accordance with the ventilation law, a minimum of at least sixty-six cubic feet of *pure* air, well circulated to the face of workings for each person employed. Experience has fully demonstrated that the minimum should not be less than one hundred cubic feet per minute per man, and such is the law in the bituminous regions. Upon the inspector insisting on a compliance with the plain mandatory command of the act, he is by some denounced as exceeding his duties, requiring impossibilities, or harrassing them in their business.

It is almost impossible to induce some operators or managers to furnish the minimum quantity of air required, while others who have an ample quantity of air entering the mine, do not carry it forward, and properly circulate it through, and to the face of working places. Some even have gone so far as to have their workmen make affidavits that the mine did not generate noxious or poisonous gases, a fact utterly unknown, as it is well known that no coal mine ever had, or ever will, have an existence that does nōt generate these gases more or less, thus suborning perjury through fear or ignorance.

It is now ten years since the enactment of the ventilation law, which has certainly been ample time to put every colliery in the anthracite region in good, safe condition, wherever there was a desire to do so. To save or curtail expense, that would more than have repaid its outlay, adequate means in some collieries have not been provided or adopted to furnish the required ventilation. Small contracted air-ways still exist, and continuance in the attempt to furnish sufficient air by natural means, were utterly impossible of accomplishment, is adhered to by others.

Very little advance in knowledge on the part of some operators and superintendents, in the improvements made in the means of properly venti-

lating mines has been acquired during this period of ten years, and much less on the part of their foremen, who have immediate charge of the inside working. This charge may be considered too severe, yet it is a truth that cannot be successfully refuted, as places can be referred to in my district, where it is applicable.

I have notified time and again these delinquent operators of the positive necessity of improvement, and have given them ample time to comply with the explicit demands of the law, preferring wherever possible to have improvements made without recourse to legal measures, and enforced stoppage of colliery. Not actuated by any motive or desire to injure or harrass any, but that we may comply conscientiously and justly with the oath taken when entering upon the duties imposed upon inspectors, that a reduction in the fearful loss of life and injured may be accomplished, and that the incalculable benefits derived through the ventilation act in the past, may be very largely increased in the future, we shall insist upon a full compliance with the law.

The benefits to be gained from the enactment of the ventilation law is but yet in its infancy, if we but only earnestly, mutually, and intelligently assist each other in carrying out its wise provisions, there can be no reason why operator, foreman, miner, and inspector should not act in harmony with each other. It is not the desire or purpose of the inspector to demand or enforce any unreasonable compliance with the law. It is much more preferable that necessary and reasonable improvements required by the inspector should be met with a corresponding acquiescence on the part of the operator, superintendent, or miner, that the expense, loss, and annoyance entailed by having recourse to legal measures to enforce compliance would be avoided.

If this is done, the improvements in the working of coal mines will be made without annoyance or undue expense, the minimum of casualties will soon be reached and maintained, the hazardous character of mining will, in a measure, be divested of many of its terrors, and, finally, a better feeling exist between employer and employé.

In this connection I desire to acknowledge the excellent ventilation of the collieries of the Philadelphia and Reading Coal and Iron Company, the Continental colliery, operated by the Lehigh Valley Coal Company, and Williamstown colliery, operated by the Summit Branch Coal Company; and further acknowledge the instructions to foremen of the Philadelphia and Reading Coal and Iron Company, by its principal officers, that all reasonable improvements required by the inspector or demanded by the law shall be strictly complied with.

### Explosions of Gas.

There were four lives lost and fifteen persons injured by explosions of gas for year 1879, as against eleven lives lost and twelve persons injured for year 1878, being an improvement on fatal list of seven, loss on non-fatal of three, or decrease, on total number, of four.

A large percentage of these accidents were clearly attributable to neglect of the most ordinary dictates of prudence. A very moderate degree of care could have prevented their occurrence.

The explosion of gas at Lykens Valley colliery, on May 5, by which two lives were lost, was the result of the most complete recklessness on the part of the victims, and criminal neglect on the part of the mine boss. The latter had not gone through, or made any examination whatever, of these workings on the morning of the accident, as positively required by the ventilation act, therefore his responsibility. The fan boy, Martin, and laborer, Ely, upon commencing work for the day, neglected to provide themselves with safety-lamps, but retained their open lights. They were engaged turning a fan to supply air to a chute that was being driven. Gas had accumulated in it during the night, the existence of which they knew, they, therefore, must have certainly known that the air propelled from the fan into the chute would bring down the gas upon them, and be ignited by their exposed lights, yet not the least precaution was taken to prevent this very evident result. They paid the penalty of their rashness with their lives. The mine or fire boss is morally as well as legally responsible for this accident, through his utter disregard of the duties he should have performed, and which are enjoined by the eighth section of the ventilation act.

The explosion on July 18, by which one life was lost, and three others slightly burned, as, also, the explosion on October 2, by which William Weaklam, fire boss, lost his life, were both attributable to inexcusable carelessness or supreme ignorance. About the same amount of prudence would be shown by entering a well stored powder magazine, with a naked firebrand, as was here shown by this fire boss in looking for gas with an open light, in a mine where it was known to exist; or, even in the preceding accident, where their lights were extinguished by first "rush" of air and gas, and then re-lighting and remaining at work.

The foregoing examples show clearly the great necessity of amending the ventilation act in such manner as to secure competent and reliable inside foremen, the enactment of general rules governing mine workings, inflicting severe penalties for their violation, and so plain, in respect to accidents resulting from ignorance, neglect, recklessness, or carelessness, that juries cannot mistake their meaning when sworn to try cases of this character.

#### Falls of Coal, Slate, Roof, &c.

There were twenty-five lives lost from above causes, out of a total of forty-six, being fifty-four per cent. of the whole number of fatal accidents for the past year. The number of non-fatal casualties from same causes were twenty-two, as against forty-four for the year 1878, the number of lives lost in that year being sixteen, an increase of nine deaths, a decrease of twenty-two injured, or a total decrease in fatal and non-fatal of thirteen.

Upon reviewing the evidence taken at the several inquests, I find that forty per cent. of the fatal accidents in this class could have been avoided,

had that proper care and prudence been exercised in the sounding of roof, dressing down loose coal after blasts, taking down dangerous overhanging coal or slate, and keeping the roof properly timbered. There was not an exception in the forty per cent. of above fatal accidents, that the miner was not aware of the dangerous overhanging coal or slate.

We fail to find words sufficiently condemnatory of this reckless disregard of life. It would seem they were pre-determined to commit suicide. Why men, endowed by their Creator with sufficient intelligence to distinguish between right and wrong, should not use that intelligence in directing them to be prudent and watchful in their hazardous employment, is a problem of the most difficult solution. The commission of suicide is generally attributed to some species of insanity, but here are men, possessed of all their mental faculties unimpaired, and with full knowledge that the neglect of the precaution that every miner is advised of, or that prudence and judgment, which all should exercise for their own safety and protection, or that of their fellow-workmen, until too late, and they are brought out of the ruins ghastly victims of their recklessness, thus adding affliction to perhaps their already distressed families.

It is known that men constantly exposed to danger, injury, or death, as all are in the mines, become so accustomed or inured to its presence, that they become careless, neglecting that caution and prudence which otherwise would not be lost sight of or deferred. Yet this does not excuse them from the misery, suffering, and loss they inflict upon their families, or that of others. The contraction of working time, low wages, liability to sickness or injury, more particularly to those engaged inside the mines, should be an ever present mentor to remind them that never, under any circumstances, should they neglect any precaution or duty devolving upon them, which involved health, safety or life. Inside foremen are in many cases responsible, and with very few exceptions very much to be censured for the occurrence of these accidents, as through neglect of due diligence in the performance of their duties, or through inexcusable ignorance, they do not make the proper examinations of working places, to see that miners properly and safely secure them against danger. The eighth section of the mining law clearly sets forth their duties. The tenth section provides penalties for neglect or refusal to perform the duties required, and the nineteenth section holds the miners and workmen responsible for their disobedience, neglect, or refusal of orders.

From motives of compassion, and in consideration of injuries sustained, or the distress that would be entailed upon dependent families, I have been deterred from legally prosecuting many of these cases, which if instituted, would in all probability have ended in the conviction, fine, and imprisonment of the parties.

In my last annual report, attention was particularly directed to this class of accidents, their cause, and means of prevention, as also upon every visit to, or examination of mines, the liability to injury from these causes

were set forth as fully, and with as much force as I was capable of, depicting the dangers arising through neglect or carelessness, and the imperative duties devolving upon both bosses and workmen, to provide all precautionary measures to avoid danger. That this advice was unheeded, is evident by the large number of casualties that have occurred during the year. Deliberately ignoring alike the lessons of the past, the dictates of common sense, and the emphatic protests of the Inspector. More effective measures must be resorted to, to deter men and bosses from careless or reckless neglect of their plain duties, the law shall be hereafter rigidly enforced, whenever and wherever it is violated.

#### Mine Cars, Machinery, and Miscellaneous Accidents.

There were eight lives lost by mine cars, two by machinery, and six from miscellaneous causes; twenty-six persons were injured by mine cars, four by machinery, and twenty-five from miscellaneous causes, a total of sixteen fatal and fifty-five non-fatal casualties from above causes, or within a fraction of forty-nine per cent. of entire casualties for the year.

Of the above number of lives lost, seven are attributable to want of proper care, if not worse, and could, with a limited share of prudence, been avoided.

It is an exceedingly unpleasant duty to re-open the wounds and harrow the feelings of relatives and friends of those who have "gone hence," but as a means of prevention in the future of similar accidents, or rather casualties, we are necessitated to direct attention to them that in pointing out their causes, and how easily avoided, they may possibly assist in deterring others from committing like wrongs, and thereby save life or limb.

One of the saddest fatal occurrences of the year, and one much commented upon at the time, principally owing to the standing and intelligence of the victims, together with the manner in which they lost their lives, occurred at Summit Branch colliery, in May. William Savage, Lewis W. Snyder, machinists, and James Parkin, boiler-maker, were required to go down in the mine to repair some of the machinery. Two mine cars, coupled together, loaded with timber and a small boiler, had been partly run over the "knuckle," at the head of slope, and attached to lowering rope, in readiness to be dispatched to the bottom of slope. On the opposite track, at bottom of slope, two cars, loaded with coal, were attached to rope, ready to be hoisted as the cars at top, loaded with timber, &c., were lowered. In violation of the mine law, which strictly forbids riding up or down slopes or shafts—on or against loaded cars—these men got "aboard." Upon starting to lower, the cars ran rapidly about twenty yards, then brought up suddenly with a jerk, which snapped the connection of cars to rope, and they were dashed to the bottom at a fearful speed and shattered against the wall of coal. The loaded cars on opposite track did not present any appearance of having been moved, showing conclusively the existence of slack rope on the drum. The top of slope above the "knuckle" is somewhat flat, one car having only been run over the "knuckle," the other car

and weight of rope between it and drum in all probability sustaining it until the engine was started, thus leaving them ignorant of the existence of this slack rope, yet not excusing them for their direct violation of a well-known law, and for which they paid the fearful penalty—death—each leaving a widow, and together eighteen orphans, to mourn their untimely and sad taking off.

There is nothing that I could write that should impress more forcibly than the recital of the foregoing occurrence, upon workmen in and about mines, the requisite obedience to law, enacted for their protection and safety, as also the inevitable penalty attached to lax discipline.

Among the miscellaneous casualties, that of Charles Dreshman, miner, aged twenty-two years, working at Vaughn colliery, which occurred November 5, presents a very singular case, a description of which will be found in the list of persons injured resulting in death. No injuries were found upon his person, nor anything to account for his death, other than that of the supposition that he was frightened to death.

| DATES. | Names of Persons Killed. | Names of the Collieries. | Occupation. | Age. | Wife. | Children. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| Jan. 9 | John Ruch, . . . . | Sterling, . . . . . | Miner, . . . | 27 | Yes, . . | 2 | Fall of top slate, while robbing pillar. |
| 10 | Henry Lee, . . . . | Williamstown, . . | Miner, . . . | 38 | Yes, . . | 2 | Fall of coal and slate, while engaged barring off loose coal from where a blast had been fired preparatory to drilling another hole. |
| 22 | Peter Reichwein, . | Monitor, . . . . . | Miner, . . . | 30 | Yes, . . | 2 | Fall of coal. Driving chute for breast. And on previous evening, on quitting work, had fired blast. On returning to work in the morning, the deceased commenced dressing off some loose coal that the blast had not thrown out, and while thus engaged a bench of coal over him fell, killing him instantly. |
| 24 | Samuel Shadle, . . | West Brookside, . | Driver, . . . | 18 | Single, | | Hauling, with mule, a mine car from carpenter shop to main track, where other cars were standing. He fell or was caught between the bumpers as the cars came together, inflicting injuries causing death within half an hour. |
| Feb. 18 | Joseph Krawls, . . | Big Mountain, . . | Miner, . . . | 29 | . . . . . | . . | Falling of top coal. Deceased worked too far ahead of overhanging top coal, unsupported by timber, and very unsafe. A skilled miner, exercising the smallest particle of prudence, would have taken down or made secure this overhanging mass of coal. The result here is entirely owing to carelessness, or rather recklessness. |
| 20 | James Harvey, . . | Preston, No. 2, . . | Slate picker, | 13 | . . . . | . | Run over by loaded dirt dumper on dirt bank. |
| Mar. 14 | Charles Roeder, . . | Mt. Carmel shaft, . | Laborer, . . | 22 | Single, | . . | Fall of top coal. Engaged with miner trimming up, after blast, when coal fell, killing him instantly. |
| 17 | William Coutts, . | Williamstown, . . | Miner, . . . | 38 | . . . . . | . . | Fall of slate. Had sounded shortly before fall, and considered it safe. |
| 17 | Charles Thompson, | West Brookside, . | Driver, . . . | 15 | . . . . | | Seated on top of gin drum while in motion, lowering mine car into new slope being then sunk, he fell into drum box, when taken out he was very much mangled. |
| April 9 | John Evison, jr., . | Ben. Franklin, . . | Miner, . . . | 23 | . . . . . | . . | Fall of slate. From evidence taken at inquest, deceased knew that it was unsafe and dangerous, and had told his "butty," shortly before it fell, that he had heard it crack and working, yet did not get out from under it, nor make any effort to take it down. Comment is unnecessary. |
| 11 | Patrick Casey, . . | Preston, No. 2, . . | Slate picker, | 14 | . . . . . | . | Starting dirt that had become blocked in dirt chute, it rushed heavily down the chute, carrying him with it to a point about three yards below, where a plank was resting across the chute, which caught him by the neck and caused death by strangulation. |
| 12 | Peter Kell, . . . | Monitor, . . . . . | Miner, . . | 32 | Yes, . . | 3 | Fall of coal. Deceased were sinking an inside slope. Over where they were working there was a dangerous slip of coal, which the inside foreman had given them orders to timber and make safe, which order being unheeded resulted as above in death. |
| 12 | Patrick Munday, . | Monitor, . . . . . | Laborer, . . | 21 | . . . . | . . | |
| 29 | Samuel Schwenck, | West Brookside, . | Miner, . . . | 31 | Yes, . . | 3 | Fall of top rock. Had sounded it shortly before it fell, and reported solid and safe. |
| May 5 | Peter Martin, | Lykens Valley, . . | Fan boy, . . | 14 | . . . . . | . . | Explosion of gas. Martin died from burns shortly after explosion, Ely two days later. |
| 5 | William H. Ely, . | Lykens Valley, . . | Laborer, . . | 27 | . . . . . | . | The deceased were engaged turning fan to remove gas from chute that was being driven through chain pillar, with naked lights in their possession. Neither the inside foreman, nor any of his assistants had made any examination of these workings before the men went to work, clearly violating the ventilation act, and responsible, through his neglect, for this accident. |
| 10 | Henry Bernsteel, . | North Ashland, . | Miner, . . . | 39 | Yes, . . | 4 | Fall of rock. Deceased had fired three shots, and was preparing for a fourth when the rock or partition stone fell, causing immediate death. |

REGISTER OF FATAL CASUALTIES—Continued.

| DATES. | Names of Persons Killed. | Names of the Collieries. | Occupation. | Age. | Wife. | Children. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| May 17 | Thomas Smith, . . | Reliance, . . . . | Driver, . . | 18 | Single, | . . | Fall of coal in gangway. The last car for the day was being loaded where pillars were being robbed out, the deceased, in passing the wagon on the high side of gangway, preparatory to taking it out, a lump of coal, weighing about three tons, fell from side of gangway, crushing deceased against side of wagon, killing him instantly. |
| 23 | William Savage, . | Summit Branch, . | Machinist, . | 45 | Yes, . | 3 | Riding on mine cars, down slope No. 3, which were loaded with timber and a small boiler. The cars on opposite side of slope, to be hoisted, were also loaded. The cars had been run over knuckle of slope, and were hanging on the rope some five minutes prior to starting the engine, but upon starting of which the cars ran down some twenty yards, then, breaking loose from rope, were precipitated to bottom of slope. The loaded cars on the opposite side did not present any appearance or evidence of having been moved, thus showing that there was about twenty yards of slack rope, and that the momentum of cars running off this slack, when brought up taut, caused the breaking of the connections with rope. There was no break upon the drum, and deceased violated the mine law in riding on and against loaded cars. |
| 23 | Lewis W. Snyder, | Summit Branch, . | Machinist, . | 46 | Yes, . . | 8 | |
| 23 | James Parkin, . . | Summit Branch, . | Boilermaker | 36 | Yes, . . | 7 | |
| July 4 | Henry Conner, . . | Potts, . . . . . | Starter, . . | 37 | Yes, . . | 6 | Starting a breast battery, his head was caught between two rocks in draw hole. |
| 23 | John Brown, . . . | Keystone, . . . . | Top man, . | 25 | Single, | . . | Fell down slope. Some months previous to accident, on account of fire in mine, slope had been filled with water, and at the time of this accident the water was being hoisted out, the deceased being employed on top of slope to signal engineer and attend to emptying of water out of wagons. His body was not recovered until 10th of August. It is unknown whether he was killed by fall down slope or drowned, or what caused the fall. |
| 28 | James Warlow, . . | Williamstown, . . | Miner, . . . | 33 | Yes, . . | 3 | Fall of coal. Deceased and "butty" were preparing to take the piece of coal down, it being drawn and dangerous, that it would be easy to get it into chute. Deceased was engaged placing a piece of sheet iron under it when it fell, killing him instantly. |
| 31 | Frederick Dryer, . | Monitor, . . . . | Miner, . . . | 25 | Yes, . . | . . | Fall of top coal, under circumstances purely accidental. |
| Aug. 1 | Frank Nott, . . . . | Sterling, . . . . . | Miner, . . . | 35 | Yes, . . | 1 | Fall of top coal. Deceased had fired blast, and was engaged with "butty" barring off loose coal not thrown out by shot, when piece of top coal fell upon him. |
| 6 | Thomas O'Brien, . | Big Mountain, . . | Miner, . . . | 45 | Yes, . . | . . | Fall of top coal. Deceased and "butty" had tried to bar it down, but failing, had drilled a hole in it, which they charged and were about to fire, when it fell on deceased, killing him instantly. |
| Sept. 8 | Hugh Mulligan, . | Locust Spring, . . | Miner, . . . | 46 | Yes, . . | 8 | Fall of top coal. The coal in breast worked by deceased was of a slippy and dangerous character. A piece of coal, weighing about four hundred pounds, suddenly and without any indication of being loose, fell upon him. Upon examination of breast, I found that it had been worked in a skillful and careful manner. |
| 11 | Daniel McAllister, | Locust Run, . . . . | Laborer, . . | 45 | Yes, . . | 1 | Fell into well at Holmesville, and drowned. Deceased, with engineer, had been engaged fixing steam-pump at well, and had completed his work. How he fell into well is unknown. |
| 15 | William Geading, | Big Mine Run, . . | Miner, . . . | 40 | Yes, . . | 3 | Fall of top coal. Employed raking coal out of breast into chute, when slip of coal, weighing about seven tons, fell upon him. |
| Oct. 17 | Thomas Paul, . . . | Pennsylvania, . . | Miner, . . . | 50 | Yes, . . | . . | Fall of top coal. Having fired shot, deceased and "butty" had commenced to shovel coal into chute, without sounding top or dressing down dangerous and overhanging coal, while thus engaged a slip of top coal fell on deceased, killing him instantly. |

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|---|---|---|---|---|---|---|---|
| 22 | Peter Gray, . . . . | Enterprise, . . . . | Miner, . . . | 24 | Yes, . . | . . | Fall of top coal. Deceased was employed robbing pillars; the piece of coal that fell upon deceased had been sounded shortly before its fall, and pronounced sound and safe. In my examination, I found the place worked skillfully, and that no blame could attach to any one. |
| 29 | Michael Murray, . | Mt. Carmel shaft, . | Slate picker, | 15 | . . . . . | . . | The Chestnut coal chute having been blocked, Samuel Bryson (chute boss) sent deceased between four and five o'clock, P. M., to shovel back the coal from screen; the breaker at this time had quit work, and the employees had gone home. George W. Stahl, in the performance of his duties of examining the machinery on stoppage of work for day, saw the boy revolving around the line shaft of Chestnut coal screen. Notifying the engineer to stop engine, he went into breaker with outside boss, and found deceased laying on his back across the shaft, his coat wrapped tightly around it, both limbs broken, head cut, and life extinct. |
| Nov. 7 | Owen Cattigan, . . | Mt. Carmel shaft, . | Miner, . . | 49 | Yes, . . | 6 | Fall of bone coal. Deceased and "butty" (William Cauley) had drilled, and fired two holes, and some two hours afterwards, went up to face of breast, deceased commenced drilling a hole, when Cauley informed him that the place was working, that pieces were falling; he Cauley, then went down to load wagon. Shortly after he heard fall, and upon going up he found deceased covered up to waist with coal, and dead. |
| Dec. 12 | John Lynch, . . . | Ben Franklin, . . | Miner, . . . | 51 | Yes, . . | . | Fall of rock, or sulphur ball. Deceased was employed drilling hole in loose stone with hand hammer and drill, being seated upon the stone. One of his laborers (U. Miller) striking the rock, or rather sulphur ball, it fell, striking deceased on head, instantly killing him. Inside boss had given orders for short props, and laggings to be put in to prevent this ball from falling, neglect of which resulted in loss of life. |

## REGISTER OF CASUALTIES RESULTING IN DEATH.

| DATE. | Names of Persons Injured, resulting in death. | Names of the Collieries. | Occupation. | Age. | Wife. | Child'n. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|---|---|---|
| Feb. 11 | Phillip Schaum, . . | North Ashland, . . | Miner, . . . | 51 | Yes. . . | 3 | Fall of coal while drilling a hole in blasting bench. A bench of coal over him, considered safe, fell, inflicting injuries from which death resulted the following day. |
| July 18 | Thomas Connelly, | Lykens Val. slope, | Miner, . . | 45 | Yes, . . | 2 | Explosion of gas, died from injuries on 22d instant. Deceased, and three others were cutting ditch or water course across gangway, from a hole leading to finished breast in Short Mountain slope, for the purpose of letting water run down to a lower level. Some gas had come through this hole, exploding and extinguishing their lights; having re-lighted lamps, another and larger rush of gas came through, exploding, and igniting some powder near them. The three other workmen were not dangerously burned. |
| 18 | John Bergstresser, | Locust Spring, . . | Oiler and spragger, | 20 | Single, | . . | Loaded mine wagon ran over his foot, which was amputated some ten days later. Died August 1. |
| 29 | Henry Lotshaw, . | Reliance, . . . . . | Miner, . . . | 41 | Yes, . . | 8 | Fall of top coal. Deceased was engaged breaking a large lump of coal, when top coal fell, inflicting injuries from which he died same day. |
| Sept. 15 | Saml. Romberger, | Lykens Val. Slope, | Laborer, . . | 21 | Single, | . . | Run over by loaded mine cars in slope. Deceased had gone down slope to assist in putting cars on track that were off. After putting them on, and every thing supposed to be all right, the engineer was signaled, and hoisted them up; deceased being missed, was found in the slope on the track, where wagons had run over him, inflicting injuries from which he died about six hours later. |
| Oct. 2 | William Weaklam, | Lykens Val. Slope, | Fire boss, . | 36 | Yes, . . | 3 | Explosion of gas. Deceased was coming out on gangway from portion of mine assigned him for examination, and upon trying a hole with naked light, which had been driven from Short Mountain east gangway workings, he fired the gas, the force of which blew him against the opposite side of gangway, inflicting injuries from which he died shortly thereafter. |
| 11 | Stephen Prout, . . | Henry Clay, No. 1. | Miner, . . . | 48 | Yes, . . | 4 | Starting coal in battery, one of the battery props gave way in the head, the coal rushing upon him, and causing injuries from which he died upon 15th instant. |
| Nov. 5 | Charles Dreshman, | Vaughen, . . . . | Miner, . . . | 22 | Single, | . . | Supposed to have died from nervous shock, produced by extreme fright. Deceased was employed in shoveling fine dirt and clay that was laying on top, and around some loose coal that was blocked on top of a hole or chute driven from gangway to surface, and used to deliver coal to gangway. The latter was stripped or exposed by breaches or cavings in from old workings of Bancroft. The deceased not having returned home in the evening, upon request of his sister, David Vaughen, accompanied by several others, proceeded to the mine, and after diligent search, found him lying partly on his left side and face, with right limb down the chute. A small quantity of loose earth was upon him, but not of sufficient weight or quantity to do him serious injury. There was no gas of any kind present, nor could there have been, as the place was open to surface. |
| 20 | Michael Colbey, . . | Lancaster, . . . . . | Miner, . . . | 54 | Single, | . . | Explosion of powder. Pouring powder out of keg into a can, a spark from his lamp fell into it, exploding both keg and can, and burning him to such an extent as to cause his death three days later. Comment upon the careless handling of powder is unnecessary, with the foregoing result as an example. Will miners ever heed these warnings? |
| Dec. 12 | And'w J. Williams, | West Brookside, . | Laborer, . . | 48 | Yes, . . | 4 | Fall of coal. Deceased having been called to by his partner to get out of the way, that there was going to be a fall, in attempting to do so, was not quick enough, and was struck by a piece of slate, which overlay the coal next to main top rock, throwing |

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| | | | | | | | him down against wagon and slate, with face downwards, inflicting injuries resulting in death two days later. |
| 26 | Edward Thomas, . | Locust Spring, . . | Hoisting engineer, . . | 54 | Yes, . . | 5 | Knocked off bumpers of mine wagons, and run over by them. Deceased and carpenter were down in slope making repairs, which, when completed, and two wagons attached to rope being near them, they determined to ride up. Having signaled the engineer several times to hoist, and not doing so, the carpenter (Mr. Kiernan) walked up the slope, and told engineer to hoist deceased, who was in wagon down the slope; proceeding to do so, he noticed that the rope was coiling upon the drum in jerks, when he stopped engine, and Mr. Kiernan went down slope to examine what was wrong. On reaching wagons, he found front one off the track, and below the wagons the deceased, his head laying inside east rail, his feet across west rail, right arm at wrist cut off, and otherwise severely injured, causing death the following day. Deceased stated that he was standing upon front bumper of wagon, that the door was thrown over and resting on side, and that upon starting to hoist, it had slipped off, and swinging through inside of wagon had knocked him off, the wagons running over him. |

REGISTER OF NON-FATAL CASUALTIES.

| DATE. | Names of Persons Injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| Jan. 11 | Peter Barrett, . . . | Tipman, . . . . . | North Ashland, . . . . . | Caught under wheel of loaded wagon; hand mashed. |
| 13 | Joseph Gabreish, . | Miner, . . . | Henry Clay Shaft, . . . . . | Burned by powder. |
| 17 | August Schwearin, | Driver, . . . . . | Tunnel, . . . . . | Caught between wagon and collar; arm broken. |
| 20 | Charles Henning, . | Miner, . . . . . | West Brookside, . . . . . | Pick in the hands of another glancing, went through foot. |
| 24 | John Marquardt, . | Laborer, . . . . | Preston, No. 2, . . . . . | Caught between wagon and rock; arm broken. |
| 30 | John Peters, . . . . | Tipman, . . . | North Ashland, . . . . . | Lifting car on track, lever slipped; finger cut off. |
| 31 | Dennis Butler, . . | Miner, . . . . . | Preston, No. 1, . . . . . | Coal rolling; arm broken. |
| Feb. 3 | John Schnuren, . | Laborer, . . . . | Tunnel, . . . . . | Collar-bone broken, by fall. |
| 3 | Joseph Morris, . . . | Door boy, . . . . | Potts, . . . . . | Finger cut off by mine car wheel. |
| 8 | Charles Newman, . | Miner, . . . . . | Henry Clay Shaft, . . . . . | Slip of coal from face of breast; arm badly injured. |
| 14 | James Costello, . . | Platform man, . . | Potts, . . . . . | Pushing slate off platform; leg broken and ankle dislocated. |
| 14 | Thomas O'Brien, . . | Loader, . . . . | Preston, No. 2, . . . . . | Explosion of gas; burned slightly. |
| 17 | Jacob Weikle, . . | Starter, . . . . . | Merriam, . . . . . | Riding in mine wagon, and attempting to get out, was caught by a chute, and injured about abdomen. |
| 21 | Thomas Gregg, . . | Pump engineer, . | Locust Run, . . . . . | Spike ran through hand. |
| 27 | August Henkey, . | Miner, . . . . . | Potts, . . . . . | Sledge being dropped on handle of pick, it flew up, striking and breaking small bone of wrist. |
| 27 | Joseph Burgh, . . . | do. . . . . | Enterprise, . . . . . | Ignited keg of powder; severely burned. |
| 28 | Uriah Fuse, . . . . | Locomotive cond'r | Bear Valley, . . . . . | End of finger taken off by coupling chain. |
| Mar. 12 | Patrick Dixon, . . . | Miner, . . . . . | Centralia, . . . . . | Caught by morning trip of mine cars; ankle dislocated. |
| 18 | John Powell, . . | do. . . . . | Locust Run, . . . . . | Fall of mine collar, whilst timbering slope; leg broken. |
| 19 | John Snyder, . | do. . . . . | Henry Clay, No. 1, . . . . . | Coal flying from shot in gangway; thigh broken. |
| 21 | Walla Confuva, . . | do. . . . . | Sterling, . . . . . | Explosion of gas; hands and face burned. |
| April 2 | George Gillem, . | do. . . . . | Preston, No. 1, . . . . . | Fell in chute; ribs broken. |
| 2 | William Boddman, | do. . . . . | Preston, No. 2, . . . . . | Explosion of gas; ignited by lamp. |
| 4 | James Morgan, . . | Driver, . . . . | Mt. Carmel Shaft, . . . . | Caught between wagon and rib, coming out of breast; collar-bone broken, and hips injured. |
| 8 | William Abrams, . | Miner, . . . . . | Preston, No. 3, . . . . . | Piece of coal flying from pick, struck and cut eye-ball. |
| 8 | Patrick Harley, . . | do. . . . . | Bast, . . . . . | Fell on sheet-iron he was carrying up the breast; ribs |
| 11 | John Reagan, . . | Starter, . . . . . | Potts, . . . . . | Fall of coal; index finger cut off. [broken. |
| 22 | Terrence Connelly, | Miner, . . . . . | Merriam, . . . . . | Fall of coal; head and back cut. |
| 27 | George Edwards, . | do. . . . . | North Ashland, . . . . . | Fall of coal; thigh bone broken. |
| 30 | Martin Cocuskie, . | do. . . . . | Henry Clay, No. 1, . . . . | Explosion of gas; burned slightly. |
| May 12 | Daniel Fry, . . . | Contractor, . . . | Merriam, . . . . . | Coal slip from pillar; leg cut, and several toes mashed. |
| 12 | William Harris, . . | Miner, . . . . . | Henry Clay, No. 1, . . . . . | Explosion of gas; face and hands burned. |
| 12 | Ebenezer Miles, . . | Starter, . . . . . | Tunnel, . . . . . | Premature explosion of blast. |
| 15 | Elias Wolfgang, . . | Carpenter, . . . . | Potts, . . . . . | Taking off head-wheel of screw; latter dropped, mashing his fingers. |

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| 20 | Thomas McLoughlin | Miner, | Preston, No. 2, | Explosion of gas; arms and hands burned. |
| 21 | David Moreheiser, | Driver, | Preston, No. 3, | Fell under wagon; foot injured. |
| 21 | Thomas Head, | Miner, | North Ashland, | Starting coal in breast, coal carried him down the chute; two ribs broken and head cut. |
| 21 | John Casey, | Slate picker, | Burnside, | Fell off steps on rail of dirt road, under breaker; leg broken. |
| June 13 | Wm. Dunkelberger, | Miner, | Merriam, | Fall of top coal; foot mashed. |
| 13 | Martin Pilaski, | do. | Burnside, | Fall of slate; head injured. |
| 14 | John Dietrich, | Topman, | Bear Valley, | Cut by mill saw severely, between elbow and shoulder. |
| 17 | John Hughes, | Miner, | Preston, No. 3, | Fell into gunboat pit at bottom of slope; thigh and nose broken. |
| 19 | Edward Noble, | Driver, | Locust Spring, | Coupling wagons; hand mashed. |
| 24 | John A. Evans, | Fan boy, | Henry Clay, No. 1, | Explosion of gas. |
| 25 | Edward Straub, | Locomto'e helper, | West Brookside, | Wheel of locomotive ran over toes of foot. |
| July 2 | Simon Schrub, | Laborer, | do. | Pushing wagon slipped and fell, striking wrist against rail; arm broken. |
| 11 | Charles Schroeder, | Miner, | Bast, | Lump of coal struck rake, driving it into his foot. |
| 11 | Emanuel Lewis, | do. | Cameron, | Fall of coal; leg fractured. |
| 12 | James Wilson, | Driver, | Potts, | Caught between wagon and timber; elbow dislocated. |
| 15 | Arthur Nash, | Platform man, | North Ashland, | Slipped and fell into platform mesh; two ribs broken. |
| 18 | Thomas Finn, | Miner, | Lykens Valley Slope, | Explosion of gas. |
| 18 | James Douglass, | do. | do. do. | |
| 18 | George Williams, | Laborer, | do. do. | |
| 21 | Albert Miller, | Driver, | West Brookside, | Riding on cover of wagon, it jumped the track, he falling into it; leg broken. |
| 29 | Anthony Carl, | Loader boss, | Merriam, | Caught between rail and wagon; bruised about abdomen. |
| Aug. 1 | Edward Foy, | Miner, | North Ashland, | Fell down manway; shoulder dislocated. |
| 9 | Samuel Owens, | do. | Sterling, | Explosion of gas; hands, face, and neck burned. |
| 12 | Thomas Collins, | Starter, | Preston, No. 2, | Finger caught between break-stick and top; nail torn off. |
| 16 | Michael Reddy, | Miner, | Henry Clay Drift, | Fall of top rock; severely injured. |
| 18 | William Friend, | Door boy, | Potts, | Caught between wagon and chute-prop; body severely squeezed. |
| 20 | Elias Lovell, | Miner, | North Ashland, | Fall of coal; hand cut. |
| 21 | Henry Woodley, | Laborer, | Mt. Carmel Shaft, | Rolling lump of coal; broke finger. |
| 30 | James Swift, | do. | Excelsior, | Fall of top rock; leg broken. |
| 30 | Patrick Kelley, | Miner, | Merriam, | Fell into gunboat pit; head cut, hip sprained. |
| Sept. 2 | Thomas Costolet, | do. | Locust Spring, | Fell in traveling-way; ribs broken. |
| 3 | Watkin Powell, | do. | Locust Run, | Plank struck him on head, whilst employed sinking well. |
| 4 | Joseph Schroyer, | Laborer, | Burnside, | Squeezed between mule and gangway prop; finger broken. |
| 5 | James Harran, | Starter, | Preston, No. 3, | Explosion dynamite powder; foot burned. |
| 9 | William Knauf, | Miner, | Henry Clay, No. 1, | Explosion of gas; slightly burned. |
| 11 | Nimrod Kramer, | Laborer, | Reliance, | Ruptured by lifting coal. |
| 14 | Adam Brown, | Driver, | Henry Clay, No. 1, | Caught between sprag and prop; hand badly cut. |
| 15 | Edward Jones, | Slope contractor, | Peerless, | Making cartridge, prematurely exploded; severely burned. |
| 16 | John Nash, | Miner, | Henry Clay, No. 1, | Explosion of gas. |
| 16 | David Griffiths, | do. | do. do. | |

REGISTER OF NON-FATAL CASUALTIES.—Continued.

| DATE. | Names of Persons Injured. | Occupation. | Name of the Collieries. | Cause of Accident. |
|---|---|---|---|---|
| 24 | Patrick Lavelle, | Miner, | North Ashland, | Fall of top coal; head cut. |
| 25 | Thomas Sobey, | Driver, | Bast, | Kicked by mule; face and breast injured. |
| 27 | James Monaghan, | Laborer, | Preston, No. 2, | Caught in wheel of truck; top of thumb cut off. |
| Oct. 6 | William E. Waters, | Inside boss, | Bast, | Fall of coal from slip; leg and ribs broken, |
| 8 | Martin Cannon, | Miner, | North Ashland, | Eye-ball cut by piece of coal. |
| 10 | John Fitzpatrick, | do. | Williamstown, | Caught between mine cars; leg crushed. |
| 15 | August Ernst, | Contractor, | Merriam, | Near shot when explosion occurred; face cut. |
| 19 | Gideon Wary, | Miner, | North Ashland, | Fall of top coal; head cut. |
| 22 | James Guinan, | do. | Williamstown, | Fall of coal; leg broken. |
| 24 | Frank E. Ossman, | do. | Henry Clay, No. 1, | Caught between mine cars and prop; severely injured. |
| 27 | John Pensiuna, | do. | Black Diamond, | Supposing that blast had missed returned, and when near it exploded, shattering cheek-bone, knocked left eye out. |
| 29 | Richard Kealey, | do. | North Ashland, | Explosion of gas; face, neck, and hands burned. |
| 30 | George Brehm, | Starter, | Potts, | Caught at draw-hole, while drilling hole in piece of rock; thigh broken, and severely bruised. |
| 31 | Israel Jones, | Miner, | Mt. Carmel Shaft, | Jammed between top and wagon; arm and side bruised. |
| Nov. 5 | Henry Denger, | Laborer, | West Brookside, | Fall of top slate and dirt; thumb broken. |
| 10 | John D. Thomas, | Inside boss, | Sterling, | Explosion of powder. |
| 10 | George Harper, | Fire boss, | do. | |
| 10 | Martin Darkin, | Bottom man, | do. | |
| 13 | Patrick O'Donnel, | Loader, | Locust Spring, | Caught between wagons; leg fractured. |
| 17 | Walter Scoble, | Driver, | Henry Clay Drift, | Mine cars jumped track, jamming driver against side of gangway; ankle broken. |
| 18 | John Henry, | do. | Burnside, | Caught between wagon and side of gangway; hand broken. |
| 19 | Josiah Nixon, | Miner, | Luke Fidler, | Fall of coal; small bone of leg broken. |
| 19 | George A. Wolfe, | Loader, | West Brookside, | Caught between sprag and wagon wheel; finger mashed. |
| 27 | Henry Fulmer, | Miner, | Locust Spring, | Fall of top rock; head cut. |
| Dec. 1 | Frank Langton, | Engineer, | Tunnel, | Struck by piece of coal; eye severely bruised. |
| 2 | Thomas Monaghan, | Miner, | Henry Clay, No. 1, | Explosion of powder, ignited by spark falling from lamp; severely burned. |
| 8 | Robert Thompson, | do. | Summit Branch, | Fall of rock; leg broken. |
| 15 | Thomas Casey, | Laborer, | Merriam, | Fall of coal; leg broken. |
| 9 | George Steinhilber, | Miner, | Big Mine Run, | Fall of coal; back seriously injured. |

**Recapitulation and Classification of Fatal Accidents for year ending December 31, 1879.**

| | |
|---|---|
| Explosion of fire-damp, C. $H^2$ gas, | 2 |
| Falls of coal, slate, rock, &c., | 22 |
| Mine cars, | 5 |
| Machinery, | 2 |
| Starting battery, | 1 |
| Miscellaneous, | 3 |
| Total, | 35 |

**Recapitulation and Classification of Accidents resulting in Death for year ending December 31, 1879.**

| | |
|---|---|
| Explosion of fire-damp, C. $H^2$ gas, | 2 |
| Falls of coal, slate, rock, &c., | 3 |
| Mine cars, | 3 |
| Explosion of powder, | 1 |
| Miscellaneous, | 2 |
| Total, | 11 |

**Recapitulation and Classification of Non-fatal Accidents for year ending December 31, 1879.**

| | |
|---|---|
| Explosion of fire-damp, C. $H^2$ gas, | 15 |
| Explosion of powder and blasts, | 11 |
| Falls of coal, slate, rock, &c., | 22 |
| Mine cars, | 26 |
| Machinery, | 4 |
| Mules, | 2 |
| Miscellaneous, | 23 |
| Total, | 103 |

**Statement for Five Years of Casualties, their Ratio to Coal Mined, Number of Employees, &c.**

| YEARS. | Killed. | Seriously injured. | Total. | Number employees. | Number tons coal mined. | RATIO. Employees to each casualty. | RATIO. Tons of coal mined to each life lost. | RATIO. Tons of coal mined to each person injured. | RATIO. Tons of coal mined to each casualty. |
|---|---|---|---|---|---|---|---|---|---|
| 1875, | 38 | 106 | 144 | 9,585 | 3,348,726 | 66.5 | 88,124 | 31,591.15 | 23,225 |
| 1876, | 37 | 61 | 98 | 10,652 | 3,208,306 | 108.6 | 86,711 | 52,595.03 | 32,737.16 |
| 1877, | 28 | 66 | 94 | 10,857 | 3,471,562 | 115.5 | 123,984 | 52,599.07 | 36,931.10 |
| 1878, | 47 | 128 | 175 | 11,106 | 3,070,218.14 | 63.4 | 65,323.16 | 23,986.10 | 17,544.02 |
| 1879, | 46 | 103 | 149 | 11,094 | 3,816,122.16 | 74.6 | 82,959.04 | 37,049.14 | 25,611.11 |
| Total, | 196 | 464 | 660 | 53,294 | 16,914,935.10 | 428.6 | 447,102 | 197,822.09 | 136,049.19 |
| Average, | 39¼ | 92⅞ | 132 | 10,659 | 3,382,987.02 | 85.7 | 89,420.08 | 39,564.10 | 27,210 |

**Names of Collieries in Operation in the Mining District of Schuylkill, Third, or Shamokin Division, during the five years ending December 31, A. D., 1879.**

| NAMES OF THE COLLIERIES. | Location of Collieries. | Names of Operators. | Class of Collieries. | COAL PRODUCED. | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | * 1875. | 1876. | 1877. | 1878. | 1879. |
| Mt. Carmel Shaft, | Alaska Station, Northl'd co | Philad. and Reading C. and I. Co., | Shaft, | | 71,384.07 | 148,305.10 | 121,267.09 | 180,931.16 |
| Bast, | Big Mine Run, Schuylkill co | do. do. | Slope, | | 82,641.14 | 118,911.09 | 86,462.11 | 141,435.17 |
| West Brookside, | Tower City, Schuylkill co., | do. do. | Tunnel & slope, | | 172,651.15 | 369,573.07 | 282,264.00 | 410,815.09 |
| Bear Valley, | Shamokin, | do. do. | Shaft and drift, | | 55,007.06 | 55,632.07 | 75,719.04 | 98,417.02 |
| Burnside, | Carbon Run, Northl'd co., | do. do. | Slope, | | 60,500.00 | 60,637.15 | 2,685.10 | 56,462.01 |
| George Fales, | Shamokin, | do. do. | do. | | 15,189.15 | 4,000.00 | 5,803.17 | 3,957.08 |
| Helfenstine, | Helfenstine, | do. do. | Tunnel, | | 16,308.07 | 37,366.09 | 11.00 | 6.10 |
| Keystone, | Locust Dale, | do. do. | Slope, | | 32,001.06 | 80,000.00 | 56,720.16 | 27,604.09 |
| Locust Run, | Ashland, | do. do. | Slope & tunnel, | | 52,953.03 | 80,940.00 | 41,450.03 | |
| Merriam, | Locust Summit, | do. do. | Slopes, | | 115,326.11 | 136,073.10 | 85,500.14 | 64,345.19 |
| Locust Spring, | Locust Gap, | do. do. | do. | | 22,699.11 | 72,623.10 | 43,094.05 | 65,770.02 |
| Potts, | Locust Dale, | do. do. | Slope, | | 39,067.05 | 103,806.15 | 81,515.14 | 88,493.04 |
| North Ashland, | Dark Corner, Columbia co., | do. do. | do. | | | 11,460.13 | 71,375 15 | 128,118.11 |
| Preston, No. 2, | Girardsville, | do. do. | do. | No. 1, | 17,525.09 | 37,718.02 | 80,584.18 | 93,544.12 |
| | | | | | 32,179.02 | 76,374.12 | | |
| Preston, No. 3, | do. | do. do. | do. | No. 4, | 38.00 | 22,019.11 | 38,600.10 | 91,278.12 |
| Tunnel, | Ashland, | do. do. | do. | | 76,439.19 | 100,735.03 | 66,296.09 | 71,413.11 |
| N. Franklin, Nos. 1 and 2, | Trevorton, | do. do. | Slope and drift, | | 39,349.06 | 73,134.04 | 52,638.17 | 84,537.14 |
| Reliance, | Mt. Carmel, | do. do. | Slope, | | 32,708.14 | 16,359.19 | 7,892.17 | 84,866.13 |
| Big Mountain, | Shamokin, | Patterson, Llewellyn, & Co., | Drifts, | | 105,530.00 | 130,251.14 | 97,837.06 | 148,551.06 |
| Excelsior, | Excelsior, Northumb'd co., | C. W. Kingsley, | Tunnel & drifts, | | 37,943.01 | 45,295.05 | 76,011.10 | 67,195.10 |
| Enterprise, | do. do. | Thomas Bomgardner, | Slope, | | 72,550.17 | 72,743.18 | 67,886.10 | 110,581.03 |
| Locust Gap, | Locust Gap, | Graeber & Shepp, | do. | | 52,371.16 | 76,000.00 | 68,344.18 | 86,068.05 |
| Franklin, | Shamokin, | A. A. Heim, | Drift, | | 4,252.07 | 3,844.06 | 3,528.07 | 2,472.02 |
| Henry Clay, No. 1, | do. | Langdon & Co., | Shaft, | | 83,374.14 | 8,531.13 | 9,998.01 | 137,183.07 |
| | | | | | | 72,617.11 | | |
| Peerless, | do. | John Cruikshank, | Drift and slope, | | | 12,087.07 | 33,499.15 | 23,038.10 |
| Stirling, | Carbon Run, Northl'd co., | Kendrick & Co., | Slope, | | 20,394.12 | 103,044.01 | 54,085.14 | 76,545.14 |
| Royal Oak, | Shamokin, | Tillet & Son, | Drift, | | 700 00 | 304.02 | 295,00 | 392.10 |
| Ben Franklin, | Donteyville, Northl'd co., | Baumgardner & Co., | Tunnel & drift, | | 31,145.01 | 21,314.00 | 38,622,03 | 51,604.13 |
| Monitor, | Locust Gap, | George W. Johns & Bro., | Slope, | | 81,620.00 | 131,110.13 | 95,126,13 | 110,429.03 |
| Cameron, | Shamokin, | Mining and Mineral Company, | do. | | 178,662.16 | 166,047.00 | 160,194.00 | 161,403.19 |
| Luke Fidler, | do. | do. do. | do. | | 100,544.11 | 119,576.15 | 103,964.16 | 114,651.06 |
| Short Mountain, | Wiconisco, Dauphin county | Lykens Valley & Short Mt. Coal Co | do. | | 151,093.08 | | 112,095.09 | 191,784.00 |
| Summit Branch, | Williamstown, Dauphin co | Summit Branch Coal Company, | Tunnel & slope, | | 239,768.04 | 263,674.02 | 237,239.12 | 259,889.10 |
| Pennsylvania, | Green Ridge, Northl'd co., | Mining and Mineral Company, | Slope, | | | | | 17,102.04 |
| Lancaster, | Coal Run, Northl'd co., | Smith & Keiser, | Drifts, | | 16,146.00 | 6,964.08 | 8,697.03 | 13,946.13 |
| Black Diamond, | Mt. Carmel, | William Schwenck & Co., | Slope, | | 35,207.02 | 23,713.09 | 19,616.11 | 13,022.14 |
| Centralia, | Centralia, | G. M. Prevost, | do. | | 38,207.19 | 62,976.00 | 62,133.10 | 37,805.00 |
| Hazel Dell, | do. | George Troutman, | do. | } 29,384.00 | | } 45,420.00 | 6,835.00 | 13,193.00 |
| Lilly, | do. | do. | do. | | | | 7,711.00 | 2,774.00 |
| Stewartsville, | Mt. Carmel, | William Montelius, | Slopes, | | 60,042.12 | 74,000.17 | 80,418.15 | 55,106.16 |
| Big Mine Run, | Big Mine Run, | J. Taylor & Co., | Drifts, | | | 19,900.00 | 48,715.06 | 63,303.18 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Continental, | Centralia, | J. T. Audenried & Co., | Tunnel, | | | 25,228.13 | 53,857.17 | 107,603.00 |
| Buck Ridge, | Shamokin, | May Audenried & Co., | Tun. slps. & dfts | | 55,182.00 | 43,560.12 | 46,198.02 | 77,500.00 |
| Big Run Gap, | Williams Valley, Dauphin co | James Fennel, | | | | 2,008 05 | 1,798.00 | 2,703.10 |
| Glen City, | Glen City, Columbia co., | J. A. Losee, | Slope, | | 17,454.06 | 14,784.14 | 22,430.15 | 26,762.04 |
| Glen, | Centralia, | Bryson & McBriarty, | Drift, | | | | 300.00 | 200.00 |
| Kline, | Montana, Columbia co., | J. L. Kline, | Land sale, | | | | 239.15 | 239.00 |
| Big Mountain, No. 2, | Mt Carmel, | Northumberland Coal Company, | Drift, | | 1,000.00 | | 592.05 | 600.00 |
| Vaughn, | Ashland, | D. Vaughn & Co., | Drifts, | | 1,482.00 | | 1,532.00 | 3,838.00 |
| Little Mine Run, | Centralia, | Piffer & Geraghty, | do. | | | | 9.10 | 23.00 |
| Carson, | Shamokin, | Philip Goodwill & Co., | Drift, | | | | 1,430.00 | 5,185.00 |
| Montana, | Montana, Columbia co., | Miller, Rupp & Weaver, | Slope, | | | | 68.15 | 118.05 |
| Gensil, | Centralia, | Pulaski Gensil, | Drift, | | | | 245.10 | 32.00 |
| Franklin, No. 2, | Barry twp., Schuylkill co., | S. S. Bickel, | Tunnel, | | | | 9,000.00 | 14,085.00 |
| Greenback, | Greenback, Northl'd co., | Gorman & Toudy, | Drifts, | | 23,917.04 | | 7,132.12 | 16,567.08 |
| West Rausch Gap, | Valley View, Schuylkill co, | W. H. Yohe, | do. | | | | 453.10 | 986.00 |
| Ashland Estate, | | A. Bancroft, | Land sale, | | 987.16 | | | 156.00 |
| Monroe, | | A. H. Church, | do. | | | | | 10,345.18 |
| Bear City, | | Frank K. Martz, | do. | | | | | 150.00 |
| Germantown, | | E. H. Herb, | do. | | | | | 167.10 |
| Brentzil, | Rocktown, Schuylkill co., | Brentzil & Cleaver, | Slope, | | | | | 75.00 |
| West Hazel Dell, | Centralia, | William Piffer, | Land sale, | | | | 202.00 | 117.00 |
| Centralia Outcrop, | do. | Jones & Sykes, | do. | | | | | 19.00 |
| Little Diamond, | | Donahoe & Curran, | do. | | | | | 156.00 |
| Packer, | Mt. Carmel, | D. J. Lewis, | | | | 1,250.05 | 5,000.00 | 370.08 |
| Hickory Ridge, | Hickory Ridge, Northl'd co | Mineral and Mining Company, | Tunnel & slope, | | 9,622.17 | 23,241.04 | 21,520.02 | Idle. |
| Big Lick, | Dayton, | Summit Branch Railroad Company, | Slope, | | 1,482.05 | 52,001.12 | | |
| Big Run Gap, | Big Run Gap, | do. do. | Two drifts, | | 3,000.60 | | | |
| Hickory Swamp, | Shamokin, | Mineral Railroad and Mining Co., | Tunnel & slope, | | 30,872.04 | | | |
| West Lehigh, | Glen City, | F. L. Shuman, | Slope, | | 18,000.00 | | | |
| North Side, | Lykens Valley, | Ed. Miller, | | | | 2,080.12 | | |
| Marshall, | Red Ash, | George Roup, | Drift, | | | 971.16 | | |
| | | | | | 2,588,005.17 | 3,229,357.00 | 2,816,747.14 | 3,720,603.16 |
| Local consumption, | | | | | 151,971.04 | 242,205.00 | 253,471.00 | 95,519.00 |
| Total for five years, | | | | 3,348,726.00 | 2,739,977.01 | 3,471,562.00 | 3,070,218.14 | 3,816,122.16 |

*District changed by Board of Examiners.

Report of Ventilation, Employees, Coal Mined, Days

| COLLIERIES | OPERATORS. | INSIDE. | | |
|---|---|---|---|---|
| | | Number inside bosses. | Number of miners. | Number laborers and company men. |
| Mount Carmel shaft, | Philadelphia and Reading Coal and Iron Co., | 3 | 178 | 49 |
| Bast, | do. do. do. | 5 | 106 | 69 |
| West Brookside, | do. do. do. | 3 | 196 | 220 |
| Bear Valley, | do. do. do. | 2 | 70 | 53 |
| Burnside, | do. do. do. | 1 | 98 | 42 |
| George Fales, | do. do. do. | 1 | 26 | 16 |
| Helfenstine, | do. do. do. | 1 | 2 | 1 |
| Keystone, | do. do. do. | 1 | 7 | 1 |
| Locust Run, | do. do. do. | 1 | ..... | 1 |
| Merriam, | do. do. do. | 4 | 48 | 64 |
| Locust Spring, | do. do. do. | 3 | 106 | 50 |
| Potts, | do. do. do. | 4 | 41 | 50 |
| North Ashland, | do. do. do. | 1 | 72 | 47 |
| Preston, No. 2, | do. do. do. | 4 | 91 | 36 |
| Preston, No. 3, | do. do. do. | 4 | 65 | 68 |
| Tunnel, | do. do. do. | 4 | 10 | 44 |
| North Franklin, Nos. 1 and 2, | do. do. do. | 1 | 95 | 27 |
| Reliance, | do. do. do. | 1 | 132 | 21 |
| Big Mountain, | Patterson, Llewellyn & Co., | 2 | 150 | 50 |
| Excelsior, | C. W. Kingsley, | 1 | 68 | 8 |
| Enterprise, | Thomas Baumgardner, | 1 | 95 | 52 |
| Locust Gap, | Graeber & Shepp, | 1 | 42 | 23 |
| Franklin, | A. A. Heim, | 1 | 14 | ..... |
| Henry Clay, No. 1, | Langdon & Co., | 2 | 150 | 73 |
| Peerless, | John Cruikshank, | 1 | 56 | 12 |
| Sterling, | Kendrick & Co., | 1 | 100 | 26 |
| Royal Oak, | Tillett & Son, | ..... | 1 | 1 |
| Ben Franklin, | Baumgardner & Co., | 1 | 51 | 20 |
| Monitor, | G. W. Johns & Bro., | 1 | 125 | 56 |
| Cameron, | Mining and Mineral Company, | 1 | 158 | 67 |
| Luke Fidler, | do. do. | 1 | 150 | 38 |
| Short Mountain, | Lykens Valley and Short Mountain Coal Co., | 3 | 184 | 189 |
| Summit Branch, | Summit Branch Coal Company, | 5 | 258 | 173 |
| Pennsylvania, | M. and M. Company, | 1 | 50 | 38 |
| Lancaster, | Smith & Keiser, | 1 | 28 | 1 |
| Black Diamond, | William Schwenk & Co., | 1 | 20 | ..... |
| Centralia, | G. M. Prevost, | 1 | 41 | 50 |
| Hazel Dell, | George Troutman, | 1 | 30 | 6 |
| Lilley, | do. | 1 | 2 | 4 |
| Stewartsville, | William Montelius, | 1 | 62 | 28 |
| Big Mine Run, | J. Taylor & Co., | 2 | 90 | 34 |
| Continental, | J. T. Audenried & Co., | 1 | 47 | 88 |
| Buck Ridge, | May Audenried & Co., | 1 | 90 | 30 |
| Big Run Gap, | James Fennel, | ..... | 5 | 4 |
| Glen City, | J. A. Lesee, | 1 | 19 | 21 |
| Glen, | Bryson & McBriarty, | ..... | 1 | 1 |
| Kline, | J. L. Kline, | 1 | 1 | 1 |
| Big Mountain, No. 2, | Northumberland Coal Company, | 1 | 3 | 1 |
| Vaughn, | D. Vaughn & Co., | ..... | 4 | 2 |
| Little Mine Run, | Peiffer & Geraghty, | ..... | ..... | ..... |
| Carson, | Philip Goodwill & Co., | 1 | 20 | 20 |
| Montana, | Miller, Rupp & Beaver, | ..... | ..... | ..... |
| Gensil, | Pulaski Gensil, | ..... | 1 | ..... |
| Franklin, No. 2, | S. S. Bickel, | 1 | 13 | 15 |
| Greenback, | Gorman & Toudy, | 1 | 29 | 24 |
| West Rausch Gap, | W. H. Yohe, | ..... | 2 | 1 |
| Ashland estate, | A. Bancroft, | ..... | ..... | ..... |
| Monroe, | A. H. Church, | 1 | 15 | 16 |
| Bear City, | Frank K. Martz, | ..... | 2 | ..... |
| Germantown, | E. H. Herb, | ..... | 1 | ..... |
| Brentzil, | Brentzil & Cleaver, | ..... | ..... | ..... |
| West Hazel Dell, | William Piffer, | ..... | ..... | ..... |
| Centralia out-crop, | Jones & Sykes, | ..... | ..... | ..... |
| Packer, | D. J. Lewis, | ..... | 4 | ..... |
| | | | 3,525 | ..... |

**Worked, &c., for year ending December 31, 1879.**

| INSIDE. | | | OUTSIDE. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Number drivers. | Number door boys. | Total. | Number bosses and mechanics. | Number laborers and company men. | Number drivers and slate pickers. | Total. | Gross total. | *Number mules and horses. | Number locomotives inside. | Number of kegs of powder used. | Number days worked by breaker. |
| 33 | 19 | 282 | 12 | 49 | 143 | 204 | 486 | 46 | . . . . . | 5,160 | 262 |
| 14 | 9 | 203 | 11 | 41 | 84 | 136 | 339 | 34 | . . . . . | 2,085 | 255 |
| 21 | 58 | 498 | 20 | 53 | 113 | 186 | 684 | 116 | 1 | 7,250 | 279 |
| 20 | 5 | 150 | 9 | 30 | 79 | 118 | 268 | 40 | 1 | 1,505 | 276 |
| 14 | 7 | 162 | 7 | 28 | 86 | 121 | 283 | 28 | . . . . | 1,325 | 178 |
| 7 | 2 | 52 | 7 | 9 | 18 | 34 | 86 | 16 | . . . . | 50 | 19 |
| . . . . | . . . . | 4 | 1 | 1 | . . . . | 2 | 6 | 1 | . . . . . | . . . . | ‡ |
| . . . | . . . . | 9 | 6 | 14 | . . . . | 20 | 29 | . . . . . | . . . . . | 165 | 99 |
| . . . . | . . . . | 2 | 6 | 7 | . . . . | 13 | 15 | . . . . . | 2 | 15 | ‡ |
| 11 | 8 | 135 | 12 | 38 | 71 | 121 | 256 | 21 | . . . . . | 1,695 | 199 |
| 8 | 6 | 173 | 8 | 41 | 91 | 140 | 313 | 26 | . . . . . | 1,500 | 143 |
| 12 | 11 | 118 | 13 | 37 | 68 | 118 | 236 | 35 | . . . . . | 607 | 229 |
| 9 | 5 | 134 | 13 | 45 | 102 | 160 | 294 | 29 | 1 | 2,810 | 245 |
| 13 | 8 | 152 | 14 | 49 | 90 | 153 | 305 | 42 | . . . . . | 1,270 | 243 |
| 12 | 9 | 158 | 8 | 40 | 79 | 127 | 285 | 32 | 1 | 825 | 249 |
| 12 | 6 | 76 | 16 | 39 | 77 | 132 | 208 | 4 | . . . . | 123 | 159 |
| 14 | 5 | 142 | 13 | 38 | 76 | 127 | 269 | 30 | . . . . | 2,400 | 193 |
| 9 | 6 | 169 | 12 | 46 | 128 | 186 | 355 | 26 | . . . . | 2,600 | 176 |
| 20 | 14 | 236 | 10 | 30 | 60 | 100 | 336 | 62 | . . . . . | 4,000 | 268½ |
| 7 | 4 | 88 | 6 | 21 | 62 | 89 | 177 | 28 | . . . . | 1,717 | 206½ |
| 17 | 1 | 166 | 11 | 22 | 54 | 87 | 253 | 30 | †1 | 2,401 | 248½ |
| 5 | 3 | 74 | 14 | 26 | 75 | 115 | 189 | 30 | . . . . . | 1,594 | 250 |
| 2 | . . . . | 17 | 1 | 4 | 11 | 16 | 33 | 3 | . . . . . | . . | 70 |
| 6 | 2 | 233 | 8 | 27 | 66 | 101 | 334 | 30 | . . . . . | 2,730 | 278 |
| 3 | . . . . | 72 | 4 | 15 | 26 | 45 | 117 | 13 | . . . . . | 600 | 144 |
| 6 | 3 | 136 | 6 | 21 | 47 | 74 | 210 | 17 | . . . . . | 1,960 | 245 |
| . . . . | . . . . | 2 | . . . . | 2 | . . . . | 2 | 4 | 3 | | | |
| 6 | . . . . | 78 | 5 | 16 | 44 | 65 | 143 | 22 | . . . . . | 850 | 236 |
| 12 | 2 | 196 | 6 | 32 | 85 | 123 | 319 | 30 | . . . . . | 2,597 | 246½ |
| 30 | 5 | 281 | 11 | 64 | 68 | 143 | 404 | 66 | †1 | 3,357 | 286 |
| 30 | 3 | 222 | 8 | 28 | 86 | 122 | 344 | 52 | . . . . . | 2,751 | 220 |
| 34 | 34 | 444 | 51 | 83 | 109 | 243 | 687 | 111 | †1 | 2,612 | 251½ |
| 52 | 25 | 513 | 14 | 65 | 153 | 232 | 745 | 97 | . . . . . | 2,543 | 247½ |
| 5 | 3 | 97 | 12 | 28 | 40 | 80 | 177 | 18 | . . . . . | 588 | 97½ |
| 3 | . . . | 33 | 3 | 3 | 13 | 19 | 52 | 8 | . . . . . | 387 | 159 |
| 1 | . . . . | 22 | 2 | 5 | 11 | 18 | 40 | 5 | . . . . | 311 | 125.7 |
| 8 | 2 | 112 | 5 | 14 | 64 | 83 | 195 | 40 | . . . . . | 500 | 126 |
| 2 | 1 | 40 | 4 | 7 | 32 | 43 | 83 | 8 | . . . . | 331 | 143 |
| . . . . | . . . . | 7 | 1 | 1 | 2 | 4 | 11 | 3 | . . . . . | 100 | 122 |
| 7 | 2 | 100 | 8 | 18 | 59 | 85 | 185 | 14 | . . . . . | 1,387 | 187 |
| 8 | 13 | 147 | 8 | 30 | 86 | 124 | 271 | 28 | . . . . . | 2,109 | 158½ |
| 8 | 4 | 148 | 10 | 37 | 70 | 117 | 265 | 18 | 1 | 2,438 | 211½ |
| 6 | . . . . | 127 | 1 | 13 | 55 | 74 | 201 | 23 | . . . . . | 900 | 206 |
| 2 | . . . . | 11 | 1 | 3 | 1 | 5 | 16 | 5 | . . . . . | 75 | 170 |
| 2 | 1 | 44 | 5 | 17 | 37 | 59 | 103 | 10 | . . . . . | 544 | 185.6 |
| . . . . | . . . . | 2 | . . . . | 2 | 1 | 3 | 5 | 1 | | | |
| . . . . | . . . . | 3 | . . . . | 1 | . . . . | 1 | 4 | 2 | | | |
| 1 | . . . . | 6 | . . . . | 2 | . . | 2 | 8 | 1 | | | |
| 1 | . . . . | 7 | . . . . | . . . . | 2 | 2 | 9 | 1 | . . . . . | 96 | 240 |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . | . . . . | *2 | | | | |
| 1 | . . . . | 42 | 4 | 8 | 20 | 32 | 74 | 6 | . . . . . | 247 | 104 |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | *3 | | | | |
| . . . . | . . . . | 1 | . . . . | 3 | . . . . | 3 | 4 | 2 | | | |
| 2 | . . . . | 31 | 4 | 13 | 14 | 31 | 62 | 5 | . . . . . | 200 | 177 |
| 5 | . . . . | 59 | 7 | 14 | 39 | 60 | 119 | 16 | . . . . . | 419 | 115 |
| 1 | . . . . | 4 | . . . . | 2 | . . . . | 2 | 6 | 1 | . . . . | 36 | 267 |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | *5 | | | | |
| 2 | . . . . | 34 | 14 | 18 | 23 | 55 | 89 | 4 | . . . . . | 395 | 70 |
| 1 | . . . . | 3 | . . . . | 2 | . . . . | 2 | 5 | 2 | . . . . . | 10 | 100 |
| . . . . | . . . . | 1 | . . . . | 1 | . . . . | 1 | 2 | 1 | . . . . . | 4 | 85 |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | *66 | | | | |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | *5 | | | | |
| . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | . . . . | *2 | | | | |
| 1 | . . . . | 5 | 1 | 1 | 4 | 6 | 11 | 3 | . . . . . | 12 | 10 |
| . . . . | . . . . | 6,453 | . . . . | . . . . | . . . . | 4,560 | 11,094 | 1,315 | . . . . . | . . . . . | 201½ |

* Marked thus the employees are not classified nor included in inside and outside totals.
† Outside. ‡ Not working.

**Report of Ventilation, Employees, Coal**

| COLLIERIES. | VENTILATION. | | | | |
|---|---|---|---|---|---|
| | Diameter fan. | Power. | Revolutions per minute. | Drag, inches. | Number cubic feet per minute discharged. |
| Mount Carmel shaft, | 18 | 40 | 55 | .7 | 57,807 |
| Bast, | 15 | 25 | 111 | 1.5 | 18,134 |
| West Brookside, | 2—18 | ..... | ..... | 1.3 | 63,756 |
| | 16 | | | | |
| Bear Valley, | 14 | 50 | 80 | 1 | 19,654 |
| Burnside, | 12 | 40 | 98 | .6 | 32,834 |
| George Fales, | Natural. | ..... | ..... | ..... | ..... |
| Helfenstine, | ..... | ..... | ..... | ..... | ..... |
| Keystone, | 18 | 50 | ..... | ..... | 25,567 |
| Locust Run, | ..... | ..... | ..... | ..... | ..... |
| Merriam, | 18 | 40 | 90 | 2.2 | 40,250 |
| Locust Spring, | 12 | 20 | ..... | .8 | ..... |
| Potts, | 16 | 30 | 110 | 2.5 | 43,981 |
| North Ashland, | 12 | 20 | 80 | 1 | 42,251 |
| Preston, No. 2, | 15 | ..... | 90 | 1.6 | 24,750 |
| Preston, No. 3, | 2—15 | 40 | 50 | .4 | 11,465 |
| | 16 | 40 | 87 | 2.6 | 31,157 |
| Tunnel, | 3—13 | 40 | ..... | ..... | 35,000 |
| | 14 | 12 | | | |
| | 18 | 30 | | | |
| North Franklin, Nos. 1 and 2, | 10 | 15 | ..... | ..... | 10,000 |
| Reliance, | 12 | 20 | ..... | .6 | 31,457 |
| Big Mountain, | 12 | 20 | 160 | 1 | 14,200 |
| Excelsior, | Natural. | ..... | ..... | ..... | 21,637 |
| Enterprise, | 12 | 50 | 120 | .6 | 20,114 |
| Locust Gap, | 12 | 15 | 70 | 1 | 12,000 |
| Franklin, | Natural. | ..... | ..... | ..... | ..... |
| Henry Clay, No. 1, | 12 | 30 | 70 | .4 | 24,919 |
| Peerless, | Natural. | ..... | ..... | ..... | 4,832 |
| Sterling, | 12 | 20 | 60 | 1.2 | 10,132 |
| Royal Oak, | Natural. | ..... | ..... | ..... | 530 |
| Ben Franklin, | do. | ..... | ..... | ..... | 8,733 |
| Monitor, | 12 | 20 | 120 | .4 | 3,600 |
| Cameron, | 2—12 | 25 | 110 | 1.1 | 28,770 |
| | 14 | 60 | 120 | 2.3 | |
| Luke Fidler, | 12 | 25 | 100 | .8 | 21.837 |
| Short Mountain, | 2—14 | each 70 | each 112 | 1.8 & 1.7 | 76,440 |
| | 14 | | | | |
| Summit Branch, | 1—14 | 60 | 100 | | 195,000 |
| | 2—12 | 120 | 180 | .8 & .6 | |
| | 12 | | | | |
| Pennsylvania, | 12 | 25 | 100 | ..... | ..... |
| Lancaster, | Natural. | ..... | ..... | ..... | 6,682 |
| Black Diamond, | 12 | 20 | 90 | .3 | 3,392 |
| Centralia, | 12 | 25 | ..... | ..... | ..... |
| Hazel Dell, | Natural. | ..... | ..... | ..... | ..... |
| Lilley, | do. | ..... | ..... | ..... | ..... |

**Mined, Days Worked, &c.—Continued.**

| MACHINERY. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of engines. | Diameter of cylinder—inches. | Stroke—inches. | Hoisting drum, diameter in feet. | Hoisting rope, diameter in inches. | Number boilers. | Length in feet. | Diameter in inches. | Number persons killed. | Number persons injured. | Number tons of coal shipped. |
| 13 | . . . . . | H. P., 595 | . . . . . | . . . . . | 19 | 30 | 34 | 3 | 3 | 180,934.16 |
| 11 | . . . . . | H. P., 1,150 | . . . . . | . . . . . | 18 | 30 | 34 | . . | 4 | 141,435.17 |
| 15 | . . . . . | H. P., 400 | . . . . . | . . . . . | 26 | 30 | 34 | 4 | 6 | 410,815.09 |
| 7 | . . . . . | . . . . . | . . . . . | . . . . . | 12 | 30 | 34 | . . . | 2 | 98,417.02 |
| 5 | . . . . . | . . . . . | . . . . . | . . . . . | 11 | 30 | 30 | . . | 4 | 56,462.01 |
| 3 | . . . . . | . . . . . | . . . . . | . . . . . | 4 | 30 | 34 | . . . | . . . | 3,952.08 |
| 3 | . . . . . | . . . . . | . . . . . | . . . . . | 7 | 30 | 34 | . . . | . . . | 6.10 |
| 6 | . . . . . | . . . . . | . . . . . | . . . . . | 19 | 30 to 36 | 30 to 36 | 1 | . . . | 27,604.09 |
| 6 | . . . . . | . . . . . | . . . . . | . . . . . | 19 | 28 to 30 | 34 | 1 | 3 | |
| 7 | . . . . . | . . . . . | . . . . . | . . . . . | 25 | 20 to 30 | 30 to 34 | . . | 8 | 64,345.19 |
| 4 | . . . . . | H. P., 200 | . . . . . | . . . . . | 12 | 30 | 34 | 3 | 4 | 65,770.02 |
| 6 | . . . . . | . . . . . | . . . . . | . . . . . | 31 | 20 to 30 | 30 to 36 | 1 | 8 | 88,493.04 |
| 8 | . . . . | . . . . . | . . . . . | . . . . . | 12 | 30 | 32 to 34 | 2 | 11 | 128,118.11 |
| 7 | . . . . . | H. P., 320 | . . . . . | . . . . . | 17 | 26 to 36 | 34 | 2 | 8 | 93,544.12 |
| 7 | . . . . . | H. P., 820 | . . . . . | . . . . . | 22 | 26 to 30 | 30 to 34 | . . | 4 | 91,278.12 |
| 13 | . . . . . | H. P., 1,315 | . . . . . | . . . | 36 | 22½ to 30 | 34 to 40 | . . . | 4 | 71,413.11 |
| 6 | . . . . . | H. P., 205 | . . . . . | . . . . . | 11 | 30 | 34 | . . . | . | 81,537.14 |
| 5 | . . . . . | H. P., 260 | . . . . | . . . . . | 11 | 26 to 36 | 34 to 36 | 2 | 1 | 84,866.13 |
| 3 | 1—12 | 12 | 10 | . . . . | 5 | 30 | 30 | 2 | . . . | 148,551.06 |
| | 1—16 | 18 | | | | | | | | |
| | 1—12 | 24 | | | | | | | | |
| 2 | 1—16 | 36 | 2—8 | 1⅛ | 6 | 30 | 34 | . . . | 1 | 67,195.10 |
| | 1—14 | 18 | 6 | 1½ | | | | | | |
| 3 | 1—16 | 36 | 12 | 1⅜ | 17 | 20 to 30 | 30 to 36 | 1 | 1 | 110,581.03 |
| | 1—14 | 72 | | | | | | | | |
| | 1—21 | 48 | | | | | | | | |
| 4 | 2—20 | 72 | 2—8 | 1¾ | 12 | 30 | 36 | . . . | . . . | 86,068.05 |
| | 1—18 | 36 | 12 | 2¼ | | | | | | |
| | 1—16 | 36 | | | | | | | | |
| 1 | 7 | 36 | . . . . | . . . . | 1 | 28 | 30 | . . | . . . | 2,172.02 |
| 6 | 2—14 | 48 | . . . . . | 2 | 8 | 28 | 31 | 1 | 14 | 137,188.07 |
| | 1—16 | 36 | | | | | | | | |
| | 2—18 | 48 | | | | | | | | |
| | 1—12 | 24 | | | | | | | | |
| 2 | 1—12 | 24 | 2—6 | 1¼ | 6 | 2—30½ | 30 | . . . | 1 | 23,038.10 |
| | 1—18 | 30 | 9 | 1⅜ | | 4—34½ | | | | |
| 4 | 3—16 | 30 | 12 | 1¼ | 8 | 31 | 30 | 2 | 5 | 76,545.14 |
| | 1—12 | 16 | | | | | | | | |
| . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . | . . . . . | . . . . . | . . | . . . | 392.10 |
| 2 | . . . . . | . . . . . | 8 | 1⅛ | 6 | 28 | 28 | 2 | . . . | 51,604.13 |
| 6 | . . . . . | . . . . . | . . . . . | 1⅜ | 18 | 20 to 40 | 30 to 34 | 4 | . . . | 110,429.03 |
| | | | | 1¾ | | | | | | |
| 9 | . . . . . | . . . . . | 2—10 | 6—1¼ | 27 | 30 | 36 | . . | 1 | 161,403.19 |
| | | | 2— 8 | 4—1⅜ | | | | | | |
| | | | 1— 9 | | | | | | | |
| 9 | 2—14 | 30 | 2— 6 | 1—1¾ | 13 | 30 | 30 | . . . | 1 | 114,654.06 |
| | 2—16 | | 1— 8 | 3—1¼ | | | | | | |
| | 5—14 | | 1—10 | | | | | | | |
| . . . | . . . . . | . . . . . | . . . . . | . . . . . | 53 | 11 to 37 | 30 to 36 | 5 | 3 | 197,784.00 |
| 26 | Av'ge 15 | Average 34⅓ | 2—10 | 1⅛ | 48 | 21 to 28 | 30 to 34 | 6 | 3 | 259,889.10 |
| | | | 1—18 | 1⅜ | | | | | | |
| | | | 1— 8 | 1¼ | | | | | | |
| 4 | 2—18 | 36 | 13 | 1¾ | 9 | 28 | 34 | 1 | . . . | 17,102.04 |
| | 1—14 | 24 | | | | | | | | |
| | 1—12 | 12 | | | | | | | | |
| 1 | . . . . . | 30 | . . . . . | . . . . . | 2 | 16 | 34 | 1 | . . | 13,966.13 |
| 4 | 2—14 | each 30 | 10 | 1⅛ | 6 | 30 | 34 | . . . | 1 | 13,022.14 |
| | 2—12 | 1—18 | | | | | | | | |
| | | 1—48 | | | | | | | | |
| 3 | 1—20 | 72 | 12 | 2 | 26 | 30 | 34 | . . . | 1 | 37,805.00 |
| | 2—15 | 36 | 8 | 2¼ | | | | | | |
| 3 | . . . . . | H. P., 60, 25, 20 | 8 | 1¼ | 4 | 30 | 30 | . . . | . . . | 13,193.00 |
| . . . | . . . . . | . . . . . | . . . . . | . . . . . | . . | . . . . . | . . . . . | . . . | . . . | 2,774.00 |

**Report of Ventilation, Employees, Coal**

| COLLIERIES. | VENTILATION. | | | | |
|---|---|---|---|---|---|
| | Diameter fan. | Power. | Revolutions per minute. | Drag—inches. | Number cubic feet per minute discharged. |
| Stewartsville, | 14 | 20 | | | 5,550 |
| Big Mine Run, | 10 | 30 | 108 | .6 | 14,000 |
| Continental, | 2—12<br>16 | 50 | 120<br>90 | .7 | 15,354 |
| Buck Ridge, | 12 | 12 | 100 | | 12,000 |
| Big Run Gap, | Natural. | | | | |
| Glen City, | do. | | | | |
| Glen, | do. | | | | |
| Kline, | do. | | | | |
| Big Mountain, No. 2, | do. | | | | |
| Vaughn, | do. | | | | |
| Little Mine Run, | do. | | | | |
| Carson, | do. | | | | |
| Montana, | do. | | | | |
| Gensil, | do. | | | | |
| Franklin, No. 2, | do. | | | | |
| Greenback, | do. | | | | 15,540 |
| West Rausch Gap, | do. | | | | |
| Ashland estate, | do. | | | | |
| Monroe, | 10 | 25 | 80 | | 10,000 |
| Bear City, | Natural. | | | | |
| Germantown, | do. | | | | |
| Brentzil, | do. | | | | |
| West Hazel Dell, | do. | | | | |
| Centralia out-crop, | do. | | | | |
| Packer, | Abandoned | | | | |

**Mined, Days Worked, &c.—Continued.**

| MACHINERY. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of engines. | Diameter of cylinder in inches. | Stroke inches. | Hoisting drum, diameter in feet. | Hoisting rope, diameter in inches. | Number boilers. | Length in feet. | Diameter in inches. | Number persons killed. | Number persons injured. | Number of tons coal shipped. |
| 3 | 2—14 | 24 | 2—8 | 1¼ | 10 | 8—30 | 30 | ... | ... | 55,106.16 |
| | 1—16 | 24 | 8 | | | 2—20 | 48 | | | |
| 5 | 2—16 | 30 | 2—11 each. | 1⅛ | 16 | 6—26 | 34 | 1 | 1 | 63,303.18 |
| | 1—13 | | | 1¼ | | 10—30 | | | | |
| | 2—11 | | | | | | | | | |
| 8 | ..... | ..... | 14 | 1¾ | 19 | 30 | 34 | ... | ... | 107,603.00 |
| 5 | 1—20 | | | | | | | | | |
| | 2—16 | 48 | 9 | 1½ | 11 | 30 | 34 | ... | ... | 77,500.00 |
| | 1—14 | | | | | | | | | |
| | 1—10 | 18 | | | | | | | | |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | 2 | 2,703.10 |
| 3 | 2—15 | 24 | 2—8 | 1¼ | 8 | 22 to 30 | 30 to 34 | ... | ... | 26,762.04 |
| | | 48 | 9 | 1⅛ | | | | | | |
| | 1—18 | 72 | | | | | | | | |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 200.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 239.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 600.00 |
| 1 | 5 | 8 | ..... | ... | ... | ..... | ..... | 1 | ... | 3,838.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 23.00 |
| 2 | 1—16 | 48 | 8 | 1¼ | 4 | 30 | 30 | ... | ... | 5,185.00 |
| | 1—12 | 36 | | | | | | | | |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 118.05 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 32.00 |
| 1 | 12 | 36 | ... | ... | 2 | 30 | 30 | ... | ... | 14,085.00 |
| 2 | 1—12 | 33 | 7 | 1¼ | 4 | 25 | 23 to 34 | ... | ... | 16,567.08 |
| | 1—10 | 30 | | | | | | | | |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 986.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 156.00 |
| 3 | 1—12 | 48 | 9 | 1¼ | 6 | 28 | 32 | ... | ... | 10,345.18 |
| | 1—10 | 30 | | | | | | | | |
| | 1—20 | 72 | | | | | | | | |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 150.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 167.10 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 75.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 117.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 19.00 |
| ... | ..... | ..... | ..... | ... | ... | ..... | ..... | ... | ... | 370.08 |
| | | | | | | | | 46 | 103 | 3,720,603.16 |
| Consumed by collieries and workmen, ..... | | | | | | | | ... | ... | 95,519.00 |
| Total, ..... | | | | | | | | ... | ... | 3,816,122.16 |
| Increase over production of 1878, ..... | | | | | | | | ... | ... | 745,904.02 |

# LUZERNE AND CARBON COUNTIES,

## MIDDLE DISTRICT.

OFFICE OF INSPECTOR OF COAL MINES,
WILKES-BARRE, PA., *April 30, 1880.*

His Excellency HENRY M. HOYT,
*Governor of the Commonwealth of Pennsylvania:*

SIR: I have the honor to submit this my annual report as inspector of coal mines for the Wilkes-Barre or Middle District of Luzerne and Carbon counties, for the year ending December 31, 1879.

Before another annual report be due, my present term of office will have expired—my second or present commission having been dated or issued 19th day of July, 1875; hence my term will expire 18th day of July, 1880.

The present report contains a fearful list of mine casualties, both fatal and non-fatal, and I am sorry to have occasion to report a large increase in the number of killed and maimed during the year over that of the few latter years.

The great increase was produced by various causes, such as a greater number of persons employed, greater number of days of labor performed, hence greater time incurred in the danger, and, as a matter of course, an increase in the casualties. But the change in the ratio of tons per life lost is not thus accounted for, yet those fluctuations up and down must be expected and cannot be avoided, as one case where a large number of persons are included so greatly change the ratios. The production has been greater than at any previous period, from this district, having worked a larger number of days and employed a larger number of persons than for some years before, if ever. During 1878, 13,045 were employed, and averaged only 139.62 days, with a production of 4,082,372, and 36 lives lost, averaging 113,399 tons produced per life lost. In the year 1879, we employed 15,582, whose average time of work was 204 days, showing an increase of 46.18 per cent. in time worked, and the production was 6,310,256 tons, averaging to the 65 lives lost 97,080 tons per life lost. The report treats upon the causes of these accidents, and recommends that managers be required to pass a rigid examination and be in possession of certificates of competency; as also other subordinate officers, &c.

There are several tables relating to fans, time worked, &c.; rules for the government of benefit associations at our mines, hospitals, &c.; education of our mining youths; also, drawings of hand boring machines, patented by the respective parties; besides the usual tables of accidents.

Number of lives lost during the year, 65; injured seriously, 185; widows, 38; and orphans, 140.

Very respectfully submitted,

T. M. WILLIAMS,

*Inspector of Coal Mines.*

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#### Steam Boilers.

For one year more we have been blessed, in not having been visited by boiler explosion catastrophes. Yet I cannot fail to call attention to what appears to me as imminent danger. That is our present system of steam boiler inspection, which is little better than a farce, in comparison to what it ought to be.

#### Coal Production for 1879.

The following are the items of data relating to our coal production in this district during the year last past:

Coals sent to market, in tons of 2,240 pounds, 5,931,691; coals sold as local sales, and consumed around the mines in generating steam, &c., partially estimated, 378,615 tons; total amount of coal mined, in tons of 2,240 pounds, 6,310,256 tons, including the item of 213,618 tons, estimated, and added to the returns for local sales and consumption, where returns were not made in full, on the basis of six per cent. of the said returns.

#### Casualties, Widows, and Orphans.

| | |
|---|---|
| Number of lives lost during the year, | 65 |
| Number of persons *seriously* injured, | 185 |
| Total, | 251 |
| Widows, | 38 |
| Orphans, | 140 |

**TABLE No. 1.**—*Exhibits number of coal breakers, steam boilers, mules inside and outside, actual of days worked by total employees, coal returns per colliery ; also, tonnages per*

| NAME OF COLLIERY. | Number of breakers. | Number of steam boilers. | NUMEER OF MULES IN USE. | | | Number of actual miners. |
|---|---|---|---|---|---|---|
| | | | Inside. | Outside. | Total | |
| Salem, Shickshinny, | 1 | 4 | 12 | 10 | 22 | 40 |
| No. 1 Breaker, Nanticoke, | 1 | 15 | 18 | 11 | 29 | 73 |
| No. 2 Breaker, Nanticoke, | 1 | 62 | 87 | 10 | 97 | 209 |
| No. 3 Breaker, Nanticoke, | 1 | 12 | 25 | 8 | 33 | 74 |
| Warrior Run, | 1 | 16 | 9 | 7 | 16 | 74 |
| Franklin Coal Company, | 1 | 21 | 15 | 8 | 23 | 75 |
| Hillman, | 1 | 6 | 12 | 3 | 15 | 30 |
| Maltby, | 1 | 18 | 25 | 5 | 30 | 56 |
| Hutchison, | 1 | 13 | 26 | 6 | 32 | 65 |
| East Boston, | 1 | 12 | 20 | 3 | 23 | 60 |
| No. 1 Breaker, Kingston Coal Company, | 1 | 10 | 22 | 2 | 24 | 63 |
| No. 2 Breaker, Kingston Coal Company, | 1 | 19 | 33 | 1 | 34 | 68 |
| Chauncey, | 1 | 2 | 9 | 2 | 11 | 12 |
| Boston, Delaware, Lackawanna and Western Railroad Co., | 1 | 12 | 33 | 8 | 41 | 60 |
| Avondale, Delaware, Lackawanna and Western Railroad Co., | 1 | 10 | 25 | 12 | 37 | 82 |
| Enterprise, | 1 | 11 | 17 | 14 | 31 | 75 |
| Wyoming, | 1 | 12 | 32 | 6 | 38 | 88 |
| Forty Fort, | 1 | 9 | 29 | 5 | 34 | 80 |
| R. S. Pool, | 1 | 5 | 4 | 2 | 6 | 12 |
| Red Ash Coal Company, | 1 | 3 | . . . | . . . | . . . | 40 |
| Dodson, Plymouth Coal Company, | 1 | 9 | 13 | 2 | 15 | 25 |
| Henry, Lehigh Valley Coal Company, | 1 | 12 | 40 | 5 | 45 | 65 |
| Midvale, Lehigh Valley Coal Company, | 1 | 6 | 8 | 4 | 12 | 40 |
| Prospect Lehigh Valley Coal Company, | 1 | 25 | 50 | 15 | 65 | 120 |
| Mineral Spring, Lehigh Valley Coal Company, | 1 | 6 | 18 | 8 | 26 | 55 |
| Exeter, Lehigh Valley Coal Company, | 1 | 16 | 55 | 10 | 65 | 120 |
| Mill Creek, Delaware and Hudson Canal Company, | 1 | 20 | 39 | 5 | 44 | 100 |
| Pine Ridge, Delaware and Hudson Canal Company, | 1 | 15 | 19 | 2 | 21 | 45 |
| Laurel Run, Delaware and Hudson Canal Company, | 1 | 9 | 28 | 9 | 37 | 74 |
| Baltimore Slope, Delaware and Hudson Canal Company, | 1 | 14 | 20 | 8 | 28 | 50 |
| Baltimore Tunnel, Delaware and Hudson Canal Company, | 1 | 24 | 29 | 3 | 32 | 70 |
| Plymouth, No. 2, Delaware and Hudson Canal Company, | 1 | 12 | 40 | 9 | 49 | 95 |
| Plymouth, No. 3, Delaware and Hudson Canal Company, | 1 | 12 | . . . | . | . . . | . . . |
| Plymouth, No. 4, Delaware and Hudson Canal Company, | 1 | 12 | 15 | 4 | 19 | 54 |
| Plymouth, No. 5, Delaware and Hudson Canal Company, | 1 | 9 | 39 | 3 | 42 | 71 |
| Wanamie, No. 1, Lehigh and Wilkes-Barre Coal Company, | 1 | 9 | . . . | . . . | . . . | . . . |
| Wanamie, No. 2, Lehigh and Wilkes-Barre Coal Company, | 1 | 9 | 45 | 11 | 56 | 118 |
| Sugar Notch Shaft, Lehigh and Wilkes-Barre Coal Company, | 1 | 15 | 28 | 8 | 36 | 120 |
| Sugar Notch Slope, Lehigh and Wilkes-Barre Coal Company, | 1 | 18 | 20 | 8 | 28 | 175 |
| Hartford, Lehigh and Wilkes-Barre Coal Company, | 1 | 15 | 33 | 11 | 44 | 125 |
| Audenried, Lehigh and Wilkes-Barre Coal Company, | 1 | 24 | 25 | 2 | 27 | 101 |
| Empire, No. 4 Shaft, Lehigh and Wilkes-Barre Coal Co., | 1 | 36 | 55 | 5 | 60 | 185 |
| Diamond Shaft, Lehigh and Wilkes-Barre Coal Company, | 1 | 42 | 26 | 5 | 31 | 102 |
| Lance, Lehigh and Wilkes-Barre Coal Company, | 1 | 9 | 37 | 3 | 40 | 90 |
| Nottingham, Lehigh and Wilkes-Barre Coal Company, | 1 | 21 | 77 | 4 | 81 | 230 |
| Washington, Lehigh and Wilkes-Barre Coal Company, | 1 | 10 | 40 | 9 | 49 | 95 |
| Ellenwold Shaft, | 1 | 12 | 2 | 3 | 5 | 8 |
| Waddell's Drifts, | 1 | 4 | 5 | 3 | 8 | 28 |
| Totals, | 53 | 785 | 1,259 | 282 | 1,541 | 3,697 |

REMARKS.—Those lines marked thus ‡ are only estimated ; those † are not used in the calculations, and * indicate averages.

The following coal breakers were not in operation during the year ; Wanamie, No. 1, Mocanacqua, Jersey, Young's Slope, Jersey, No. 2, Hollenback Shaft, No. 3, Delaware and Hudson, Plymouth, Empire, No. 2, and Ellenwold Shaft. No. 3 Hollenback Slope had no breaker for sev-

*coal cutters or miners, men and boys employed inside and outside, total employees, total number breaker, per miner, and per employee per day, in the Wilkes-Barre District, during 1879:*

| Number of Workmen Employed. | | | | Total employees. | Days worked in breaker. | Days by total employees. | Coal shipped to market—tons 2,240 pounds. | Total coal production—tons 2,240 pounds. | Coal Produced per Day. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inside. | | Outside. | | | | | | | Per breaker. | Per miner. | Employee. |
| Men. | Boys. | Men. | Boys. | | | | | | | | |
| 96 | 13 | 24 | 34 | 167 | 228.00 | 38,076 | 35,400 | 40,000 | 175.43 | 4.38 | 1.05 |
| 179 | 26 | 69 | 61 | 335 | 248.00 | 83,080 | . . . . . | 157,617 | 635.96 | 8.70 | 1.87 |
| 535 | 98 | 153 | 118 | 904 | 247.50 | 221,740 | . . . . . | 344,246 | 1,390.89 | 6.65 | 1.55 |
| 136 | 14 | 57 | 76 | 283 | 192.80 | 54,562 | . . . . . | 105,000 | 544.60 | 7.35 | 1.92 |
| 137 | 23 | 36 | 72 | 268 | 110.50 | 30,056 | 55,077 | 61,152 | 553.40 | 7.48 | 2.03 |
| 183 | 37 | 157 | 47 | 424 | 179.00 | 75,896 | 138,486 | 151,190 | 884.63 | 11.28 | 1.99 |
| 68 | 17 | 10 | 12 | 107 | 208.00 | 22,256 | . . . . . | 45,000 | 216.34 | 7.21 | 2.02 |
| 120 | 13 | 50 | 27 | 210 | 241.00 | 50,610 | 68,471 | 73,684 | 305.74 | 5.45 | 1.45 |
| 158 | 39 | 38 | 63 | 298 | 256.70 | 76,496 | . . . . . | 122,670 | 439.26 | 6.33 | 1.63 |
| 140 | 33 | 47 | 63 | 283 | 176.50 | 49,949 | . . . . . | 104,332 | 591.11 | 9.85 | 2.09 |
| 133 | 30 | 25 | 52 | 240 | 248.00 | 59,024 | 154,918 | 158,349 | 638.38 | 10.13 | 2.68 |
| 167 | 40 | 52 | 67 | 326 | 231.00 | 75,306 | 268,316 | 270,473 | 1,170.88 | 17.11 | 3.59 |
| 32 | 11 | 9 | 17 | 69 | ‡200.00 | . . . . . | ‡20,000 | ‡20,000 | . . . . . | . . . . | ‡ |
| 144 | 30 | 28 | 63 | 265 | 201.00 | 53,265 | . . . . . | 113,797 | 566.16 | 9.43 | 2.13 |
| 198 | 35 | 40 | 74 | 347 | 266.00 | 65,702 | . . . . . | 188,512 | 708.69 | 8.64 | 2.86 |
| 151 | 28 | 33 | 54 | 266 | 190.00 | 50,540 | . . . | 100,000 | 526.31 | 7.01 | 1.79 |
| 244 | 41 | 63 | 45 | 393 | 201.00 | 78,993 | 147,222 | 158,337 | 790.23 | 8.95 | 2.00 |
| 154 | 30 | 32 | 33 | 249 | 119.50 | 29,755 | 48,829 | 51,874 | 434.09 | 5.42 | 1.74 |
| 24 | 5 | 16 | 14 | 59 | 139.00 | 8,201 | 11,459 | 14,241 | 102.45 | 8.63 | 1.73 |
| 53 | 8 | 30 | 40 | 131 | 124.25 | 16,276 | . . . . . | 24,800 | 200.00 | 5.00 | 1.52 |
| 62 | 18 | 18 | 21 | 119 | 206.00 | 24,514 | 44,671 | 46,996 | 228.13 | 15.79 | 1.92 |
| 171 | 35 | 44 | 27 | 277 | 200.00 | 55,400 | 110,000 | . . . . . | 550.00 | 8.46 | 1.98 |
| 106 | 15 | 26 | 37 | 184 | 175.00 | 32,200 | 40,000 | . . . . . | 220.85 | 5.71 | 1.24 |
| 346 | 60 | 63 | 70 | 539 | 240.00 | 129,360 | 265,000 | . . . . . | 1,104.17 | 9.20 | 2.05 |
| 106 | 23 | 41 | 55 | 225 | 122.00 | 27,450 | 55,000 | . . . . . | 450.81 | 8.20 | 2.00 |
| 291 | 53 | 69 | 58 | 471 | 197.00 | 73,087 | 205,000 | . . . . | 1,040.60 | 8.67 | 2.80 |
| 240 | 51 | 55 | 99 | 445 | 260.75 | 116,033 | 220,823 | 231,773 | 888.87 | 8.88 | 1.99 |
| 118 | 28 | 37 | 45 | 228 | 164.00 | 37,392 | 88,602 | 93,918 | 572.30 | 10.16 | 2.48 |
| 156 | 40 | 36 | 70 | 302 | 235.30 | 71,060 | 146,328 | 155,107 | 663.33 | 8.30 | 2.11 |
| 131 | 23 | 42 | 60 | 256 | 261.75 | 67,008 | 147,243 | 152,743 | 583.50 | 11.72 | 2.27 |
| 180 | 39 | 34 | 72 | 325 | 230.00 | 74,750 | 168,413 | 178,633 | 776.60 | 11.09 | 2.37 |
| 180 | 45 | 54 | 73 | 352 | 277.40 | 97,644 | 112,946 | 117,344 | 423.00 | 4.45 | 1.20 |
| . . . | . . . | 3 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | ‡ | Idle. |
| 114 | 29 | 39 | 62 | 244 | 210.75 | 51,423 | 110,271 | 114,126 | 541.28 | 10.02 | 2.20 |
| 186 | 52 | 42 | 52 | 332 | 218.25 | 72,459 | 141,099 | 146,359 | 670.69 | 9.58 | 2.01 |
| . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | ‡ | Idle. |
| 229 | 42 | 55 | 68 | 394 | 221.90 | 87,428 | 165,770 | . . . . . | 747.04 | 6.33 | 1.89 |
| 314 | 43 | 88 | 64 | 509 | 144.00 | 73,296 | 100,378 | . . . . . | 697.07 | 5.80 | 1.29 |
| 364 | 46 | 99 | 71 | 580 | 87.25 | 50,605 | 81,012 | . . . . . | 928.02 | 5.40 | 1.60 |
| 322 | 53 | 84 | 129 | 588 | 192.00 | 112,869 | 186,184 | . . . . . | 965.65 | 7.75 | 1.65 |
| 347 | 77 | 62 | 130 | 616 | 70.25 | 24,376‡ | 66,676 | . . . . . | 945.75 | 9.42 | 2.73 |
| 532 | 110 | 75 | 112 | 829 | 259.50 | 215,125 | 358,457 | . . . . | 1,381.77 | 7.46 | 1.66 |
| 344 | 39 | 76 | 46 | 505 | 171.75 | 83,734 | 155,410 | . . . . . | 904.17 | 8.87 | 1.79 |
| 190 | 30 | 50 | 38 | 308 | 172.50 | 53,130 | 111,404 | . . . . . | 645.80 | 7.11 | 2.09 |
| 541 | 105 | 87 | 120 | 853 | 228.20 | 184,654 | 352,026 | . . . . . | 1,543.00 | 6.70 | 1.90 |
| 196 | 42 | 50 | 55 | 343 | 265.65 | 91,118 | 184,981 | . . . . . | 692.50 | 7.33 | 2.30 |
| 18 | 2 | 15 | 4 | 30 | . . . | . . . . . | . . . . . | ‡ | Not shipping. | | |
| 50 | 5 | 12 | 28 | 95 | 134.75 | 12,801 | 29,066 | 29,791 | 221.09 | 7.89 | 2.32 |
| 8,883 | 1,676 | 2,322 | 2,698 | 15,582 | 204.00 | 3,071,690 | . . . . | 6,310,256 | *665.00 | *8.28 | *1.99 |

eral years. Breakers burned down: Espy, Gaylord, and Audenreid. Both the latter are being rebuilt, but only Audenreid is here included. New breaker, No. 4, is building at Nanticoke and Gaylord. Breakers to add to above list 5, and steam boilers, 127. Coal shipped and mined, including 213,618 tons added to returns for home consumption, local sales, &c., &c., at the rate of 6 per cent.—Total, 6,3 0,256 tons.

**TABLE No. 2.**—*Showing the number of lives lost in the Wilkes-Barre district from 1871 to 1879, both inclusive, classified, and the percentage of each class to the total number of lives lost.*

| | 1871. | 1872. | 1873. | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | Totals. | Percentages. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Explosions of Carbureted Hydrogen Gas:* | | | | | | | | | | | |
| Explosions of carbureted hydrogen gas, | 1 | 8 | 6 | 9 | 6 | 7 | 1 | 7 | 12 | 57 | 12.58 |
| *Falls of Roof and Sides:* | | | | | | | | | | | |
| Falls of roof and sides, | 13 | 15 | 11 | 17 | 18 | 23 | 25 | 14 | 30 | 166 | |
| Falls sundry materials, | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | |
| Total by falls, | 13 | 15 | 11 | 17 | 19 | 23 | 25 | 14 | 30 | 167 | 36.86 |
| *In Shafts:* | | | | | | | | | | | |
| Falling into shafts from top, | 2 | 3 | 3 | 3 | 12 | ... | 1 | ... | ... | 24 | |
| Falling from part way down, | ... | ... | ... | ... | 2 | 1 | 1 | ... | ... | 4 | |
| Totals in shafts, | 2 | 3 | 3 | 3 | 14 | 1 | 2 | ... | ... | 28 | 6.18 |
| *By Mine Cars:* | | | | | | | | | | | |
| By mine cars, | 6 | 7 | 13 | 9 | 5 | 4 | 1 | 5 | 15 | 65 | 14.33 |
| *By Explosions of Blasting Powder:* | | | | | | | | | | | |
| By explosions of blasting powder, | 1 | ... | ... | 1 | 2 | 3 | 1 | 1 | 2 | 11 | 2.43 |
| *Miscellaneous Under Ground:* | | | | | | | | | | | |
| By blasts in coal and rock, | ... | ... | 4 | 4 | 8 | 10 | 3 | 3 | 3 | 35 | |
| By locomotive engines, | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | |
| Asphyxiated fatally from poisonous gases, | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 2 | |
| Sundries under ground, | 24 | 4 | ... | 7 | 1 | 3 | 3 | 1 | 1 | 44 | |
| Totals, miscellaneous under ground, | 24 | 4 | 4 | 11 | 9 | 14 | 6 | 6 | 4 | 82 | 18.10 |
| Totals, under ground, | 47 | 37 | 37 | 50 | 55 | 52 | 36 | 33 | 63 | 410 | 90.48 |
| *On Surface:* | | | | | | | | | | | |
| By machinery, | ... | ... | ... | 1 | 2 | 1 | ... | ... | 1 | 5 | |
| Suffocated in chutes of coal breakers, | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | 3 | |
| Crushed by cars, | ... | ... | 6 | 1 | 2 | 2 | 2 | 1 | ... | 14 | |
| Crushed by locomotives, | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 2 | |
| Sundries on surface, | 6 | 3 | 3 | 4 | ... | ... | ... | 2 | 1 | 19 | |
| Totals on surface, | 6 | 3 | 9 | 7 | 8 | 3 | 2 | 3 | 2 | 43 | 9.49 |
| Gross totals, | 53 | 40 | 46 | 57 | 63 | 55 | 38 | 36 | 65 | 453 | 100.00 |

**TABLE, No. 3.**—*Exhibits a summary of fatalities; also, the coal production in tons per life lost in the Wilkes-Barre District, in the years 1871-2-3-4-5-6-7-8-9, respectively, and classified under five heads:*

| | ACCIDENTS UNDER GROUND. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Explosions of carbureted hydrogen gas. | Falls of roof and sides. | In shafts. | By mine cars. | By blasting powder | Miscellaneous. | Above ground. | Totals. | Tons of coal mined per life lost in 1871-2-3-4-5-6-7-8-9. | Total production of this district during 1871-2-3-4-5-6-7-8-9. |
| 1871, | 1 | 13 | 2 | 6 | 1 | 24 | 6 | 53 | 56,000 | 3,000,000 |
| 1872, | 8 | 15 | 3 | 7 | ..... | 4 | 3 | 40 | 81,560 | 3,250,000 |
| 1873, | 6 | 11 | 3 | 13 | ..... | 4 | 9 | 46 | 92,000 | 4,232,000 |
| 1874, | 9 | 17 | 3 | 9 | 1 | 11 | 7 | 57 | 80,000 | 4,513,847 |
| 1875, | 6 | 19 | 14 | 5 | 2 | 9 | 8 | 63 | 67,629 | 4,261,263 |
| 1876, | 7 | 23 | 1 | 4 | 3 | 14 | 3 | 55 | 83,916 | 4,615,386 |
| 1877, | 1 | 25 | 2 | 1 | 1 | 6 | 2 | 38 | 107,377 | 4,080,327 |
| 1878, | 7 | 14 | ..... | 5 | 1 | 6 | 3 | 36 | 113,399 | 4,082,372 |
| 1879, | 12 | 30 | ..... | 15 | 2 | 4 | 2 | 65 | 97,080 | 6,310,256 |
| Total number of lives lost, and coal production, | 57 | 167 | 28 | 65 | 11 | 82 | 43 | 453 | . . . . . | 38,335,451 |
| Percentages, | 12.58 | 36.86 | 6.18 | 14.33 | 2.43 | 18.10 | 9.49 | 100 | | |

**TABLE No. 4.**—*Summary of the items of production, number of persons employed, and lives lost, together with the ratios of these items to each other, for the years 1871-2-3-4-5-6-7-8-9, respectively, in this district.*

| | 1871. | 1872. | 1873. | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | Averages. |
|---|---|---|---|---|---|---|---|---|---|---|
| Coal produced, per year, in tons, | 3,000,000 | 3,250,000 | 4,232,000 | 4,513,847 | 4,261,263 | 4,615,386 | 4,080,377 | 4,082,372 | 6,310,256 | 3,833,545 |
| Average number of persons employed, | 9,870 | 9,807 | 11,325 | 13,576 | 15,008 | 14,317 | 14,073 | 13,045 | 15,582 | |
| Ratio of production to each employee, in tons, | 304 | 331.4 | 372.6 | 332.5 | 284 | 323 | 289.88 | 312.94 | 405. | |
| Number of lives lost each year, respectively, | 54 | 40 | 46 | 57 | 63 | 55 | 38 | 36 | 65 | |
| Ratio of production, in tons, per life lost, | 56,000 | 81,560 | 92,000 | 80,000 | 67,629 | 83,916 | 107,377 | 113,399 | 97,080 | |
| Ratio of persons employed, per life lost, | 187.77 | 233.26 | 346.84 | 238.17 | 238.32 | 260.5 | 270.34 | 363.47 | 239.72 | |

**TABLE No. 5.**—*Shows the number of lives lost in each colliery respectively; total coal shipments and production; also the number of tons produced per life lost during the years 1875-6-7-8-9, in the Wilkes-Barre district.*

| NAME OF COLLIERY. | NAME OF OWNER OR LESSEE. | LOCATION OF COLLIERY. | NUMBER OF LIVES LOST ANNUALLY. | | | | | | Total tons of coals produced in the years 1875-6-7-8-9. | Tons of coal produced per life lost. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1875. | 1876. | 1877. | 1878. | 1879. | Total number of lives lost. | | |
| Red Ash, | Red Ash Coal Company, | Near Wilkes-Barre, | * | * | * | * | 1 | 1 | 24,800 | 24,800 |
| Salem, | Salem Coal Company, | Shickshinny, | | | | | | | 212,996 | ‡ |
| Warrior Run, | A. J. Davis & Co., | Warrior Run, | | 1 | 1 | | 1 | 3 | 264,363 | 88,121 |
| Chauncey, | McFarland & Co., | Near Plymouth, | 1 | 3 | | | | 4 | 126,101 | 31,525 |
| Hillman, | H. B. Hillman, | Plains township, | | | | | | | 194,000 | ‡ |
| Franklin, | Franklin Coal Company, | Wilkes-Barre township, | | 1 | | 1 | 1 | 3 | 426,915 | 142,305 |
| Wyoming, | J. H. Swoyer, | Plains township, | 2 | 1 | 2 | 2 | 3 | 10 | 688,016 | 68,801 |
| Enterprise, | H. C. Roberts & Co., | do. | 1 | 1 | 1 | | 1 | 4 | 360,538 | 90,134 |
| Forty-Fort, | J. H. Swoyer, | Kingston township, | * | 1 | 2 | 1 | 1 | 5 | 417,462 | 83,492 |
| Hutchison, | J. C. Hutchison, | do. | 4 | 4 | 1 | | 1 | 10 | 464,318 | 46,431 |
| East Boston, | William G. Payne & Co., | do. | | | | | | | 420,265 | ‡ |
| Ellenwold drifts, | Waddell & Walters, | do. | * | * | * | * | 2 | 2 | 29,791 | 14,895 |
| Pools, | R. S. Pool, | Plains township, | 1 | 1 | | | | 2 | 119,682 | 59,841 |
| Maltby. | S. C. Maltby, | Near Wyoming, | | | | | | | 92,631 | ‡ |
| Dodson, | Plymouth Coal Company, | Plymouth, | | * | | | 1 | 1 | 46,946 | 46,996 |
| | | | 9 | 13 | 7 | 4 | 12 | 45 | 3,888,874 | †86,197 |
| Exeter, | Lehigh Valley Coal Company, | West Pittston, | 2 | 7 | 1 | 3 | 3 | 16 | 774,000 | 48,375 |
| Henry, | do. do. | Plains township, | 4 | 2 | 1 | 1 | 3 | 11 | 502,069 | 45,642 |
| Midvale, | do. do. | do. | 2 | 1 | | | 2 | 5 | 139,000 | 27,800 |
| Prospect, | do. do. | do. | 1 | | 1 | 7 | 2 | 11 | 516,555 | 49,685 |
| Mineral Spring, | do. do. | do. | | 2 | | * | | 2 | 211,076 | 105,338 |
| | | | 9 | 12 | 3 | 11 | 10 | 45 | 2,172,700 | †48,282 |
| Pine Ridge, | Delaware and Hudson Canal Company, | Plains township, | 2 | 3 | | | 1 | 6 | 545,932 | 90,988 |
| Mill Creek, | do. do. do. | do. | 1 | | | 2 | 6 | 9 | 815,556 | 90,617 |
| Laurel Run, | do. do. do. | do. | | 1 | 2 | | 1 | 4 | 549,283 | 137,320 |
| Baltimore slope, | do. do. do. | do. | 3 | | | 1 | 1 | 5 | 394,551 | 78,910 |
| Baltimore tunnel, | do. do. do. | do. | | | | 1 | | 1 | 697,849 | 697,849 |
| Plymouth, No. 2, | do. do. do. | Near Plymouth, | 3 | | 1 | 1 | 1 | 6 | 413,659 | 68,943 |
| Plymouth, No. 4, | do. do. do. | do. | * | * | * | | 1 | 1 | 177,183 | 177,183 |
| Plymouth, No. 5, | do. do. do. | do. | | 1 | 1 | | 1 | 3 | 619,500 | 206,500 |
| | | | 9 | 5 | 4 | 5 | 12 | 35 | 4,213,513 | †120,386 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1, | Susquehanna Coal Company, | | Nanticoke, | 1 | 1 | 2 | 1 | . . . | 5 | 687,788 | 137,557 |
| No. 2, | do. do. | | do. | 1 | 3 | 3 | 1 | 4 | 12 | 1,240,251 | 103,354 |
| No. 3, | do. do. | | West Nanticoke, | 3 | 2 | . . . | 1 | 1 | 7 | 565,702 | 80,814 |
| | | | | 5 | 6 | 5 | 3 | 5 | 24 | 2,493,741 | †103,906 |
| No. 1, | Kingston Coal Company, | | Kingston, | . . | 1 | 2 | . . . | . . . | 3 | 570,085 | 190,028 |
| No. 2, | do. do. | | do. | 1 | . . | 1 | . . . | 3 | 5 | 928,964 | 185,793 |
| | | | | 1 | 1 | 3 | . . | 3 | 8 | 1,499,049 | †187,381 |
| Avondale, | Delaware, Lackawanna and Western Railroad Company, | | Near Plymouth, | 1 | 1 | 1 | . . . | . . | 3 | 759,077 | 253,029 |
| Boston, | do. do. do. do. | | Near Kingston, | 1 | 2 | 1 | 1 | . . . | 5 | 512,064 | 102,413 |
| | | | | 2 | 3 | 2 | 1 | . . | 8 | 1,271,141 | †158,892 |
| Wanamie, No. 2, | Lehigh and Wilkes-Barre Coal Company, | | Wanamie, | 1 | . . | 1 | * | * | 2 | 290,438 | 145,219 |
| Sugar Notch shaft, | do. do. do. | | Sugar Notch, | 2 | * | . . . | . . . | 1 | 3 | 187,003 | 62,334 |
| Sugar Notch slope, | do. do. do. | | do. | 1 | . . . | . . . | 3 | 2 | 6 | 475,052 | 79,175 |
| Hartford, | do. do. do. | | Ashley, | 2 | 1 | 2 | . . | 1 | 6 | 568,221 | 94,703 |
| Empire shaft, | do. do. do. | | Near Wilkes-Barre, | 2 | 3 | 4 | 2 | 5 | 16 | 1,145,347 | 71,584 |
| Diamond, | do. do. do. | | do. | 2 | . . . | 2 | . . . | 1 | 5 | 458,881 | 91,776 |
| Washington, | do. do. do. | | Plymouth, | . . . | 2 | 1 | . . . | . . . | 3 | 523,510 | 174,502 |
| Nottingham, | do. do. do. | | do. | 1 | 2 | . . . | 3 | 3 | 9 | 990,138 | 110,015 |
| Lance, | do. do. do. | | do. | . . . | 1 | . . | . . . | 1 | 2 | 364,368 | 182,184 |
| Audenried, | do. do. do. | | Wilkes-Barre, | 1 | 2 | 3 | 2 | 8 | 16 | 325,965 | 20,373 |
| | | | | 12 | 11 | 13 | 10 | 22 | 68 | 5,328,923 | †78,366 |
| | | | | | | | | | 233 | 20,867,941 | †89,557 |

* Indicates no coal shipments. † Averages. ‡ No death.

**TABLE No. 6.**—*Exhibits the actual number of days per month, each coal breaker in the Wilkes-Barre district was operated during 1879.*

| NAME OF COLLIERY. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red Ash, | . . . | . . . | . . . | . . . | . . . | . . . | 21 | 22.75 | 17.75 | 26 | 19 | 17.75 | 124.25 |
| Salem, | 25 | 13 | 8 | 13 | 19 | 24 | 21 | 20 | 19 | 22 | 22 | 22 | 228 |
| Warrior Run, | 4½ | 5 | 7¾ | 12¾ | 12¼ | 9¾ | 10 | 6 | 9¾ | 11¾ | 10½ | 10 | 110½ |
| Chauncey, | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 11 | 24 | 25 | 23 | 23 | 106 |
| Hillman, | 15 | 15 | 17 | 18 | 19 | 17 | 18 | 19 | 19 | 18 | 17 | 16 | 208 |
| Franklin, | 5 | 7½ | 13 | 2 | 12½ | 24¼ | 21¾ | 19 | 18 | 21¾ | 19¾ | 14¾ | 179 |
| Wyoming, | . . . | 4.5 | 13.75 | 18.25 | 21 | 20 | 17 | 23 | 24.5 | 24.75 | 17 | 17.25 | 201 |
| Enterprise, | . . . | . . . | 6 | 21 | 26 | 22 | 20 | 18 | 18 | 19 | 21 | 19 | 190 |
| Forty Fort, | . . . | . . . | . . . | . . . | . . . | 15 | 18 | 21.25 | 15 | 21 | 17.25 | 12 | 119.5 |
| Hutchison, | 17.45 | 19.2 | 20.15 | 18.3 | 22.2 | 23.2 | 20.9 | 24.7 | 24.5 | 23.85 | 22 5 | 19.75 | 256.7 |
| East Boston, | 7 | 6 | 6 | 13.25 | 13.5 | 18.75 | 17.25 | 15 | 12.5 | 19.25 | 20 | 17 | 176.5 |
| Waddell, | . . . | . . . | . . . | . . . | . . . | 14 | 19 | 19 | 23 | 21 | 19½ | 19¼ | 134¾ |
| Pool's, | 7 | 14 | 12 | 9 | 3 | 9 | 14 | 10 | 13 | 16 | 17 | 15 | 139 |
| Maltby, | 10 | 23 | 22 | 18 | 22 | 21 | 23 | 25 | 12 | 23 | 22 | 20 | 241 |
| Dodson, | 7 | 13 | 22½ | 20 | 21½ | 18 | 21 | 12 | 17½ | 17½ | 16¾ | 20½ | 206 |
| Averages, | 10.88 | 12.02 | 13.47 | 14.87 | 17.43 | 18.15 | 18.70 | 17.71 | 17.83 | 20.69 | 19.61 | 17.55 | 198.91 |
| Exeter, | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 197 |
| Henry, | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 200 |
| Midvale, | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 175 |
| Prospect. | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 240 |
| Mineral Spring, | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 122 |
| Pine Ridge, | 10¼ | 7 | 11¾ | 7¼ | 24½ | 23½ | 24½ | 20 | . . . | . . . | 14¼ | 21¼ | 164 |
| Laurel Run, | 9½ | 12 3/10 | 11½ | 15½ | 17¼ | 21½ | 24 | 25¼ | 25¾ | 27 | 24 | 21¾ | 235.3 |
| Mill Creek, | 20½ | 20 | 21½ | 19¾ | 23 | 23½ | 24½ | 25½ | 25 | 26½ | 11 | 20 | 260¾ |
| Baltimore Slope, | 20 | 20 | 19½ | 17 | 21½ | 20¾ | 25 | 24½ | 24¼ | 25½ | 22¾ | 21 | 261¾ |
| Baltimore Tunnel, | 17½ | 13¼ | 21¾ | 16¼ | . . . | 22 | 26 | 14¾ | 24¾ | 26¾ | 24¼ | 21¾ | 229 |
| Plymouth, No. 2, | 8.9 | 22.3 | 15¼ | 15 | 18.9 | 18.1 | 17 | 13¾ | 19 | 19¾ | 19 | 20.6 | 207.55 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plymouth, No. 4, | 15 | 19¼ | 15¾ | 18 | 17½ | 17½ | 17¼ | 18¼ | 18¾ | 17½ | 18½ | 17¾ | 210¾ |
| Plymouth, No. 5, | 17 | 1.7 | 15 | 19½ | 20¼ | 18¾ | 18½ | 22¼ | 21.9 | 24 | 20.9 | 18½ | 218¼ |
| Averages, | 14.83 | 15.72 | 16.52 | 16.03 | 17.83 | 20.17 | 22.06 | 20.53 | 19.8 | 22.62 | 22.09 | 20.32 | 228.52 |
| Nanticoke, No. 1, | 20¼ | 18 | 6¾ | 14½ | 25¾ | 23½ | 21 | 25 | 24¼ | 26¼ | 24½ | 18½ | 248 |
| Nanticoke, No. 2, | 23½ | 14½ | 9¾ | 17 | 24½ | 24½ | 21 | 25½ | 24 | 25 | 23½ | 17 | 247½ |
| West Nanticoke, No. 3, | 17 | 9.3 | 9.6 | 14 | 17.2 | 15.4 | 17.8 | 18.3 | 18 | 21.4 | 18.3 | 16.5 | 192.8 |
| Averages, | 20.25 | 13.93 | 8.70 | 15 | 22.48 | 21.13 | 19.93 | 22.93 | 22.08 | 24.22 | 22.02 | 17.33 | 229.35 |
| Kingston, No. 1, | 17 | 16 | 19 | 22 | 24 | 21 | 21 | 20 | 22 | 22 | 23 | 21 | 248 |
| Kingston, No. 2, | 16 | 14 | 20 | 21 | 22 | 21 | 20 | 19 | 21 | 19 | 19 | 19 | 231 |
| Averages, | 16.5 | 15 | 19.50 | 21.5 | 23 | 21 | 20.5 | 19.5 | 21.5 | 20.5 | 21 | 20 | 239.5 |
| Avondale, | 21 | 24¼ | 24¾ | 25 | 23 | 23¼ | 23½ | 25¼ | 11¼ | 26¼ | 24½ | 17¾ | 269¾ |
| Boston, | .... | .... | .... | 9 | 25½ | 24¼ | 25 | 25¾ | 25¼ | 26½ | 23 | 17 | 201¼ |
| Averages, | 21 | 24.25 | 24.75 | 17.00 | 24.25 | 23.75 | 24.25 | 25.50 | 18.25 | 26.37 | 23.75 | 17.37 | 235.5 |
| Wanamie, No. 2, | 21.3 | 18.50 | 18.25 | 19.95 | 21.85 | 19.05 | 18.5 | 19 15 | 16.65 | 20.1 | 14.55 | 14.05 | 221.9 |
| Sugar Notch Slope, | 22.75 | 22 | 25 | 17.50 | .... | .... | .... | .... | .... | .... | .... | .... | 87.25 |
| Sugar Notch Shaft, | .... | .... | .... | .... | .... | 20.5 | 24 | 22 | 19.25 | 23.75 | 18 | 16.5 | 144 |
| Hartford, | .... | .... | .... | 12 | 25.25 | 23 | 23 | 24 | 21.5 | 26 | 18.5 | 18.75 | 192 |
| Empire, | 12.25 | 19.75 | 23.25 | 24 | 26.5 | 24.25 | 18.25 | 24.25 | 24 | 23.5 | 19.75 | 17.75 | 259.5 |
| Diamond, | .... | .... | .... | .... | 11 | 24 | 25 | 24.75 | 23.5 | 29.25 | 20.25 | 18 | 171.75 |
| Audenried, | 12.50 | 14.75 | 18.75 | 14.75 | 9.5 | .... | .... | .... | .... | .... | .... | .... | 70.25 |
| Lance, | .... | .... | 10.5 | 19.5 | 20 05 | 18.1 | 18.55 | 18.25 | 16.3 | 18.8 | 17.35 | 15.1 | 172.5 |
| Nottingham, | 9 | 16.7 | 20.3 | 21.5 | 21.1 | 17.1 | 20 | 20.75 | 22 | 21.95 | 19.7 | 18.1 | 228.2 |
| Washington, | 10.75 | 20 | 25.5 | 25 | 26.1 | 22 | 24 | 24.5 | 24.75 | 25.25 | 21 | 16.8 | 265.65 |
| Averages, | 14.76 | 18.61 | 20.22 | 19 25 | 20.70 | 21.03 | 21.41 | 22.20 | 20.99 | 23.07 | 18.63 | 16.88 | |
| General averages, | 16.37 | 16.58 | 17.19 | 17.19 | 20.94 | 20.87 | 21.14 | 21.39 | 20.07 | 22.91 | 21.18 | 18.22 | |

Number of Employees in the District during 1879.

| | Actual miners. | Employés inside. | Employés outside. | Total. |
|---|---|---|---|---|
| Number of actual miners employed, . . . . . | 3,697 | | | |
| Number of men employed, including miners, . . . | . . . . | 8,886 | 2,322 | 11,208 |
| Number of boys employed, . . . . . | . . . . | 1,676 | 2,698 | 4,374 |
| Total employés, . . . . . | . . . . | 10,562 | 5,020 | 15,582 |

Conditions of the Collieries generally, and their Management.

The present condition of most of our mines in this district is satisfactory, although there are yet a few lagging behind for various reasons. I am sorry to say that our present system of management is blamable for most of the complaints that now exist in these mines not up to a fair standard. Mining is conducted on a different scale to what it was a dozen years ago, the mines being more difficult to handle, as they are many times more dangerous, being so much deeper and more extensive. More work is being done in a month now than was done in six months a few years ago. The present vetical depth of workings is from five hundred to nine hundred feet, when there were only a few workings below water-level say ten years ago. Then they employed fifty or one hundred hands; now many have as high as three hundred to six hundred and fifty hands employed inside the mines, exclusive of about twenty to fifty per cent employed as outside hands, employing as high as eight hundred and fifty hands at a colliery. Then no fire damp was met with in our mines, except it be a very rare case; now it is a rare thing to find a colliery without having it in large quantities. Then natural ventilation, small furnaces, steam jets, or exhausts were the principal measures employed as ventilation, with a few fans of very small dimensions; now each colliery is provided with from one to three or four fan ventilators, varying in diameters from fifteen to thirty-five feet respectively—the Prospect colliery having three fans, one twenty feet and two thirty feet each in diameter. Exeter colliery has two fans, one twenty feet and one twenty-one feet diameter. The Diamond colliery has two fans, one twenty feet and one twenty-four feet diameter, and an arrangement whereby to connect the fan erected to ventilate the Hollenback shafts, which is thirty-five feet diameter. The Empire colliery has four fans, one fifteen feet diameter at the No. 5 slope; one fifteen feet diameter at the old No. 1 slope, connected to Nos. 4 and 5 slopes; and two on the Hillman seam, one fifteen feet and one twenty feet diameter. Mill Creek colliery has two fans connected or running on the same shaft, ten feet diameter each, and one fan twenty feet diameter; the latter assists in ventilating one

section of Pine Ridge colliery. Wyoming colliery has two fans, one fifteen feet diameter and one twenty-five feet diameter; the former is, ordinarily, being used in exhausting dust from the coal-breaker, but may, at any time, be used in an emergency to substitute the other fan. There are two fans at No. 5, Delaware and Hudson Canal Company, Plymouth, one sixteen feet diameter and one twenty feet diameter. Nottingham and Washington collieries have three fans between them, one fifteen feet diameter and two twenty-four feet diameter each. At Avondale colliery there are two fans, each twelve feet diameter. Also, there are two fans at No. 2 slope, Nanticoke, each twenty feet diameter; and at the Kingston Coal Company's Nos. 1 and 2, they have three fans, one twelve feet, one twenty-one feet, and one twenty-five feet diameter. There is but one colliery in the district not having one or more fans, which is the Waddell or Ellenwold drifts, operated at present by Honorable Thomas Waddell and F. T. Walters & Co., except the Chauncey old mine, which is about being abandoned.

In view of the great change suggested in the above as having taken place in our mining operations, it is highly necessary that our mine officers, from the lowest to the highest, improve in their administrative, as well as executive, abilities. To cope successfully with the difficulties and dangers of our present mining, it requires considerable more skill, tact, and general knowledge than it formerly did, and this cannot be had without some practice and theory blended together. No one person is supposed to know everything about mining more than it would be in any other branch of business. Hence, we should study out what others have done, and how it was done. This may be learned in various ways, which I need not here refer to. I will here insert an abstract of the mining law adopted, in England, in 1872, relating to management of mines.

I am fully convinced that such an enactment by legislation is much needed here, and, further, am just as confident that it must be had in this or some other form, within a short period, and I should say the sooner the better for all parties interested. The law is titled "the coal mines regulation act, 1872," being the act regulating mines of coal, stratified iron-stone, shale, and fireclay.

**Certificated Managers.**

"Section 26. Every mine to which this act applies shall be under the control and daily supervision of a manager, and the owner and agent of every such mine shall nominate himself or some other person (not being a contractor for getting the mineral in such mine, or a person in the employ of such contractor) to be the manager of such mine, and shall send written notice to the inspector of the district of the name and address of such manager.

"A person shall not be qualified to be a manager of a mine to which this act applies, unless he is, for the time being, registered as the holder of a certificate under this act.

"If any mine to which this act applies is worked for more than fourteen days without there being such a manager for that mine as is required by this section, the owner and agent of such mine shall each be liable to a penalty not exceeding fifty pounds, and to a further penalty not exceeding ten pounds for every day which such mine is so worked: *Provided*, That (*a*) the owner of such mine shall not be liable to any such penalty, if he prove that he had taken all reasonable means, by the enforcement of this section, to prevent the mine being worked in contravention of this section.

"(*b*) If for any reasonable cause there is, for the time being, no manager of a mine qualified as required by this section, the owner or agent of such mine may appoint any competent person not holding a certificate under this act, to be manager, for a period not exceeding two months, or such longer period as may elapse before such person has an opportunity of obtaining, by examination, a certificate under this act, and shall send to the inspector of the district a written notice of the name and address of such manager, and of the reason of his appointment; and

"(*c*) A mine in which less than thirty persons are ordinarily employed below ground, or of which the average daily out-put does not exceed twenty-five tons, shall be exempt from the provisions of this section, unless the inspector of the district, by notice, in writing, served on the owner or agent of such mine, requires the same to be under the control of a manager.

"SECTION 27. For the purpose of granting, in any part of the United Kingdom, to be from time to time defined by an order, in writing, made by the Secretary of State, certificates of competency to managers of mines for the purpose of this act, examiners shall be appointed by a board, constituted as hereinafter mentioned. A Secretary of State may, from time to time, appoint, remove, re-appoint fit persons to form such board as follows, namely: Three persons, being owners of mines, to which this act applies in the United Kingdom, and three persons employed in or about a mine to which this act applies in the said part of the United Kingdom, not being owners, agents, or managers of a mine, and three persons practicing as mining engineers, agents, or managers of mines, or coal viewers in the said part of the United Kingdom, and one inspector under this act; the persons so appointed shall, during the pleasure of the Secretary of State, form the board, for the purpose of the said examinations in the said part of the United Kingdom."

Section twenty-eight gives the power of the board for appointing examiners; section twenty-nine gives regulations by Secretary of State as to examinations, such as rules, number, and remuneration of examiners, and the fees to be paid by applicants—which is £2. Section thirty relates to granting certificates to applicants on passing a satisfactory examination; having proven their sobriety, experience, ability, and general good conduct, then they are to receive a certificate of *competency*. Section thirty-one describes the manner in which the change takes place from the old to the new order of things, such as granting a certificate of *service* to any one

who was acting as manager either before the passage of the said act, and has since that day acted, or that he has, at any time within five years before the passage of the said act, for a period of twelve months, acted in the capacity of a manager of a mine, &c.

Section thirty-two provides for an inquiry into the competency of a person holding a certificate of management after charges have been made of incompetency or gross negligence, or a conviction for any offense under the act, then the court has power to cancel or suspend the certificate of any person holding the same; as well as for the renewing or restoring of any certificates by the Secretary of State, of any which has been taken away.

There are some further details given in the act relating to the working of the same; but the above is sufficient to indicate the drift of the said law, and its operations relating to mine management. In the English inspectors' reports for 1878 there are reports of several managers having been put on trial under this law, and in some instances their certificate was withheld, suspended, or canceled, as the court decided.

Under our mining law of 1870, it is required that there be employed, by the owner or agent in charge of every coal mine or colliery, a competent and practical inside overseer, to be called mining boss, &c., but there is no way whereby the competency of the said mining boss is required to be tested, either before or after his appointment; neither is there any method to prove his incompetency and to have him removed from office, no matter how deficient he may be found by the inspector, or that he should be pronounced grossly negligent, or found guilty of any other violation under the law, by coroner's jury or even by court; as he may still be employed either by his former or any other employer, regardless of any finding of said jury or court.

The matter of competency in our mine foremen is sadly in need of attention, and as it is now, there is no stimulus or extra inducement held out for our young miners, except it be he desires to leave the mines and follow some other calling. The young miner thinks he knows sufficient to be a common miner, and unless he has some near relative or great personal friend to assist him into some little position, he has no ho es for anything else in or around the mines; and then if he has any such, he then depends entirely on them for his advancement; and it is there where the mistake is made, as there should be inducements held out to those working in and around each mine, in the shape of a probable chance for promotion in each and every branch, on the civil service reform plan—which is so much discussed and promised in our public affairs. Instead of the advancement or promotion pointed out above, persons from other callings are frequently taken to fill some trifling position that there could be selected quite a number out of the employés in or around the mines. Instead of that, young men whom are known to possess the requisite qualifications connected with the mine should have the preference over those from outside. In that way the young and ambitious would not be forced to leave the mine when they

began to know something more than to act the part of a machine, nor discouraged, and their natural talents and abilities left dormant. Then there should also be some inducement held out for long and continued faithful services, and there would be more permanency about employment; each employé would be living and acting on his merits, knowing that his future as well as his present depended largely upon his daily actions as well as his qualifications. Should the course above suggested be strictly carried out in each and every branch, inside and around the mines, there would be a perceptible difference in the intelligence and the behavior of the employés within a short period, and a great improvement in workmanship. And as a natural consequence accidents would be less frequent, which are often caused through carelessness or ignorance on the part of the workmen themselves. In addition to the matter of examination of persons aiming to become mine managers or foremen, as above referred to, there is one other branch that should have a good deal of attention, and should, in some way, be made competitive; that is the office of a fire-boss. I think that these officers should have a good knowledge of mining and ventilation, and of the nature of gases met with in coal mines, and I incline to think that this office should be a stepping-stone to that of the next higher—certificated boss or mine foreman—that is, that one of the qualifications necessary should be a certain length of service to be required as fire-boss. The examination for fire-boss should be held by either a certificated manager or an inspector, to be fixed by the mining law, and his certificate to be held similar to that in the terms of the certificated manager. This office is of vast importance, and is frequently left on the hands of entirely incompetent persons, that have neither experience nor learning. In fact no amount of book learning should entitle any person to fill this office if not in possession of a practical knowledge as well. Then again, it is highly necessary that notwithstanding the applicant may be a good practical miner, yet his proficiency in that branch suffers none by his being in possession of a good common school education; and if the applicant is good, independent of education, he must be better with it; hence I should say they should be part of the qualification necessary to attain the position. Should the course suggested above be carried out in our coal fields in and around all the mines, it could not fail to do an incalculable amount of good to every body interested. The land owner would be benefited by having his minerals more systematically worked, and as a consequence less wasted, and which means for him greater returns. The mine operator would be benefited by having a better and more competent set of mine officers, and in consequence a higher standard of intelligence and morals amongst his workmen generally, resulting in more work and better workmanship, as also more contentment and less liability to accidents to men and machinery. The workmen would be remunerated in many ways by the improvement they would make in their educational and practical attainments, which must be recognized by those around them and by their employers, as also the appreciation of it in

society generally in which they move, besides enabling them to command better compensation for their work in their respective branches. But this is only small compared with the amount of benefit they must obtain from their own advancement, morally and intellectually, in conjunction with that of the proper and skillful working of the mines, in the improvement in the sanitary condition of the same, and the saving of lives and limbs in the prevention of those heart-rending catastrophes that must inevitably follow in the wake of ignorance.

The public, unconciously, is also interested in those much to be desired improvements, and the writer appeals to all parties interested for their aid and sympathy in bringing about the said improvements.

#### Education of Boys Connected with Mines.

The English mining laws require boys under twelve and over ten years old to attend school a certain number of hours per day and week, exclusive of Sunday school or night school; and, again, boys between the ages of ten and twelve cannot be employed underground, except upon certain educational conditions, and that the seam of coal be so thin, making it necessary to secure the services of the said youths. Then, again, none under ten years can be employed outside or about the mines. A heavy penalty is attached for a non-compliance in these matters, as also for the falsifying or forging of a certificate relating to the education of a boy. There are also restrictions of hours of employment of boys to ten hours per day, and they are not to be employed between the hours of nine at night and five o'clock in the morning; nor on Sunday; nor later than two o'clock on Saturday afternoon, &c. The mining law of Pennsylvania forbids the employment of boys under twelve years of age underground, but no provision has been made to limit the matter of employment of such on the surface, where they shou d not be employed below the age of twelve years, and the limit of twelve years of age for underground should be changed to fourteen. Then the matter of education should be inquired into, and a certain standard required before employment be granted, as boys at the said ages should be in possession of the rudiments of a common school education, and the matter of further educational means should also be considered to some extent, whenever the law may be so changed as to embrace this view of the subject.

In the State of Ohio a law was passed some time ago compelling each child between the ages of six and fourteen years to attend day school; and there is a heavy penalty against parties employing the said children during school hours, unless in some extraordinary cases of need, &c. I believe that a similar law should be enacted in each and every State, and executed. It would appear to me that there ought to be established evening or night schools, to be connected and sustained by the employés and employers of every colliery or factory employing a certain number of hands, the tax to be made as light as possible without destroying the object of having such a school. It seems to me that a tax of one half of one per cent. of their

daily earnings would be ample from the employés, and the employers to add to the aggregate a certain ratio of the same. The school to be run under the direction of a board consisting of the operator or his agent, a mining engineer, and one practical miner, and conducted in a manner to give the greatest amount of good to the greatest number of the employés; and to be in operation during the winter, spring, and fall months, unless it be found desirable, and funds permitting, to continue through the year. In such a school a vast amount of good could be done, not only to the boys but to the young men as well; and even those of middle age, if they did not wish to apply to the routine of a regular study, they could and doubtless would attend whenever there should be lectures on subjects connected with mining, or perhaps those of mineralogy or geology. This would also have a tendency to keep young men away from places where extra inducements are always held out to them in order to get their money, for which in return they receive that which stupefies their power of thinking. But instead of that they will be forced to think, when they will at once see the great importance of avoiding the allurements hinted at, and to continue in their new studies. A library connected with such a school would be one of the requisites eventually.

### Hospital.

It is well known, generally, that there is an institution in this city known as the City Hospital, and that the said hospital is sustained largely by and through the philanthropic efforts of a few noble ladies and gentlemen. The ground was donated by Mr. John Wells Hollenback. The charter was secured through the efforts of Hon. Chas. A. Miner, through whose untiring energy several appropriations were secured from the State to help sustain the same, varying in amounts from ten thousand ($10,000) to twenty-five thousand ($25,000) dollars, from year to year. The officers, at present, are given in a report inserted in this report, also its constitution and by-laws, &c. The immediate management is in charge of a committee of ladies as may be seen from the said report.

The patients of this institution are largely made up of our people, injured in and about the mines, and is free of all charge, unless it be to parties who can well afford to pay for board, &c., when a charge is made. Although this institution has been in operation since the latter part of 1872, yet very little money has been contributed by the miners or mine owners as such. It is true a small sum has been paid over by a few of the miners, but nothing in comparison to the amount of benefit derived. Then there is now an arrangement existing between the employés and the officers of the Lehigh Valley Coal Company, whereby a certain amount of a regular fund established so as to meet cases of accidents, is diverted to the matter of paying expenses at the hospital, and this, then, enables or rather entitles them to admittance to the said hospital, and a great blessing it has proven to many. There is no one class of injured persons who receive as much benefit from this hospital as our miners and laborers, in and around the

mines, and it would be nothing but right that they should devise some means whereby they may contribute to its support. One party raises the objections that it is only those improvident ones that need or require its use in general—well admitting that such be true to some extent, is it not so in every thing else? Why do the Messrs. Hollenback, Miner, Derr, Conyngham, Darlings, Wadhams, Bennett, Stickney, and the Parishes, McClintock, Dana, Wells, Dickson, Mercur, and a host of others spend their time and money on this institution? It can not be because they expect to derive any personal benefit either to themselves or their immediate friends, no, it is from pure and unselfish motives of charity. Then how much out of place are such arguments from men following the same dangerous calling regarding their fellow beings—and, indeed, the fate of a many good and industrious person has been so changed as to place him in dire and stringent circumstances, under which he would be glad to have the care and treatment of such as our present City Hospital.

The State Legislature has passed a bill recently, to provide a miner's hospital in Schuylkill county, and no doubt it will prove of great benefit to the unfortunates that may need it. How much greater blessing it is to be able to contribute to such institution than it is to be a recipient of its most valuable services and reliefs, and this is the spirit in which the workmen in and around the mines should look at this matter. Each colliery should have its accident and relief fund, and in this a provision should be made for cases sent to the hospital here or elsewhere. I also insert in this report a copy of the rules governing such a scheme, which is in operation in all the mines of the Lehigh Valley Coal Company in this district, and which, so far as I am informed, works well, and gives great and general satisfaction.

*Annual Report of the Board of Directors of the Wilkes-Barre City Hospital for the year ending December 31, 1879, with a brief History of the Institution from the Date of Organization.*

**Board of Directors.—1879.**

*President.*—Charles A. Miner.

*Vice President.*—Richard Sharpe.

*Secretary.*—Edward H. Chase.

*Treasurer.*—H. H. Derr.

*Directors.*—A. T. McClintock, Charles A. Miner, Joseph Stickney, E. P. Darling, J. Welles Hollenback, Richard Sharpe, E. C. Wadhams, H. H. Derr, George S. Bennett, E. H. Chase, R. J. Flick, and Frederick Mercur.

*Executive Committee.*—Messrs. Miner, Sharpe, Mercur, and Derr.

**Medical Staff—1879.**

*Consulting Physicians, (ex-officio Directors.)*—Edward R. Mayer, M. D., and Jonathan E. Bulkeley, M. D.

*Attending Physicians.*—J. A. Murphy, M. D., G. W. Guthrie, M. D., R. Davis, M. D., J. B. Crawford, M. D., O. F. Harvey, M. D., and I. E. Ross, M. D.

**Resident Physicians.*—L. H. Taylor, M. D., before October 1, 1879; J. T. Howell, M. D., after October 1, 1879.

*Matron.*—Mrs. M. A. Davis.

*Nurses.*—J. H. Clark, George Gransden, and Bridget Monaghan.

**Board of Visiting Managers.—1879.**

*President.*—Mrs. Lord Butler.

*Vice President.*—Mrs. R. G. Rieman.

*Secretary.*—Miss E. W. Mayer.

*Members.*—Mrs. George S. Bennett, Mrs. B. G. Carpenter, Mrs. C. M. Conyngham, Mrs. J. V. Darling, Mrs. Calvin Wadhams, Mrs. William Schrage, Miss Lydia Woodward, Miss Laura G. Brower, and Mrs. C. F. Reets.

**Board of Directors for 1880.**

*President.*—Charles A. Miner.

*Vice President.*—A. T. McClintock.

*Secretary.*—Edward H. Chase.

*Treasurer.*—H. H. Derr.

*Directors.*—J. Welles Hollenback, F. J. Leavenworth, George S. Bennett, G. M. Reynolds, Charles A. Miner, E. C. Wadhams, R. J. Flick, Fredrick Mercur, C. M. Conyngham, E. H. Chase, A. T. McClintock, and H. H. Derr.

*Executive Committee.*—Messrs. Miner, Derr, Mercur, Hollenback, and Reynolds.

**Board of Visiting Managers for 1880.**

*President.*—Mrs. C. M. Conyngham.

*Vice President.*—Mrs. C. F. Reets.

*Secretary and Treasurer.*—Miss E. W. Mayer.

*Members.*—Mrs. George S. Bennett, Mrs. J. B. Stark, Mrs. C. M. Conyngham, Mrs. J. V. Darling, Mrs. C. F. Reets, Mrs. R. G. Rieman, Mrs. Calvin Wadhams, Mrs. William Schrage, Miss R. Sharpe, Miss Lydia Woodward, Miss Laura G. Brower, and E. W. Mayer.

Sometime during the year 1870 "an appeal in behalf of a hospital" in or near Wilkes-Barre was published. It set forth the need of such an institution in a region like this, where so many men are employed and in danger of life and limb— men dependent entirely on their own labor for support— and who must necessarily suffer when disabled.

It showed, by the statistics of other hospitals, how superior the treatment of the poor in these institutions is to the treatment they can receive in their homes; superior skill, superior surgical and medical appliances,

*The present resident physician is Doctor Joshua L. Miner, otherwise the medical staff is unchanged for the year 1880.

and superior care and attention. It claimed that the position of Wilkes-Barre as a mining center especially demanded that a hospital should be located here. Then, with a proposed plan for raising the needed revenue, and some essentials of management, this appeal closed, and was signed by Doctors Dennis, Mayer, Bulkeley, Crawford, Corss, Murphy, Washburn, Rothrock, and Davis.

This appeal probably acted as a ferment, but nothing was done for almost two years after its issue. One or two thrilling occurrences during this period—such as a man dying with a crushed skull in the station-house, there being no other place to lodge him—served fully to demonstrate the position taken by the appeal, and made the good people of Wilkes-Barre open their eyes. It was then that a few enthusiastic friends of the movement went to work in earnest. The first meeting was held September 10, 1872, to consider the matter.

An executive committee, appointed at this meeting, at once went to work, rented a building on Fell street below South, and on the 10th of October, 1872, the Wilkes-Barre City Hospital was opened for the reception of patients.

The number of beds at first was twenty, but it soon became necessary to increase this number, six more being added during the following year.

Prior to the winter of 1874, the support of the hospital was derived entirely from the voluntary contributions of the people of this city. During the winter of 1874, an appropriation of five thousand dollars was received from the State.

The demands upon the institution soon became so great that it was necessary for the officers to devise some means to increase its accommodations.

In the year 1875, two valuable lots, suitable for hospital purposes, were tendered to the board of directors—one by John Welles Hollenback, a lot located on River street near Mill Creek, containing about four acres; the other by Charles Parrish, president of the Lehigh and Wilkes-Barre Coal Company, a similar lot on Meade street, near the Empire coal works. The committee to which the matter was referred chose the former, the value of which is at least ten thousand dollars. In addition to this, several thousand dollars were subscribed by citizens for building purposes; and during the fall and winter of the same year, the fine new building occupied as the hospital was erected.

During the year 1876, an appropriation of twenty-five thousand dollars was received from the State to complete and furnish the building and extend its field of usefulness.

The new building was occupied April 1, 1876. It is situated on an eminence commanding an extensive view of the most interesting portion of the Wyoming Valley, with the beautiful Susquehanna winding through it, and is surrounded by spacious grounds which have been tastefully graded and otherwise improved.

It is two stories high, built of wood, eighty-six feet square, exclusive of the verandas, consists really of four buildings surrounded by a quadrangle, and was erected at a cost of $25,000. (See engraving.) It is capable of accommodating from seventy-five to one hundred beds, and is now supplied with forty-two.

The furniture, appliances, and instruments are of the most modern and approved kind. In addition to this the prescriptions for the institution are all compounded in the hospital drug store, which is conducted by the resident physician, greatly to the advantage of the finances of the hospital.

During the past year an additional building, 30×60 feet, with accommodations for thirty beds, has been begun, to be used for fever wards, and will be ready for occupation, in case of need, early in the current year.

The improvements of the grounds has been continued, and it is proposed to complete them as fast as the funds procured will allow.

Since the date of organization, the demands upon the institution have been on the increase, as the following statement will show:

| | |
|---|---|
| Patients admitted from October 10, 1872, to January 1, 1873, (nearly three months,) | 25 |
| Patients for year 1873, | 73 |
| Patients for year 1874, | 103 |
| Patients for year 1875, | 116 |
| Patients for year 1876, | 175 |
| Patients for year 1877, | 193 |
| Patients for year 1878, | 166 |
| Patients for year 1879, | 217 |
| Grand total since opening, | 1,068 |

Total expenditures, in cash, $71,254 91.

The Board of Directors, on behalf of the friends of the hospital, wish to render grateful acknowledgment to the State authorities for appropriations received, to the Board of Public Charities for recommending, to the Legislature for passing, and to the Governor for approving the bills granting such appropriations.

In concluding this report, the Board of Directors desire to acknowledge the many contributions made by citizens of the city and vicinity, including the proceeds of concerts and other entertainments and donations from the various religious denominations, and also the services of the physicians—consulting, attending, and resident—of the Board of Visiting Managers, the matron, and all other officers of the institution.

Especially the Board tender their thanks to the ladies composing the board of visiting managers, many of whom have been active in the management since the opening of the hospital. It is largely to their generous efforts that so great a measure of help and success has attended the insti-

tution. All interested in or benefited by this charity owe them grateful acknowledgments for their tireless provision and supervision in every department of the hospital work.

By order of the Board.

CHARLES A. MINER,
*President.*

**Summary Statement of Cases treated during the year 1879.**

| | | |
|---|---|---|
| Cured, | 126 | |
| Under treatment, | 30 | |
| Benefited, | 30 | |
| Died, | 20 | |
| Not benefited, | 5 | |
| No treatment, | 3 | |
| Left before cure, | 3 | |
| | | 217 |
| Of the above number, there were— | | |
| Males, | 173 | |
| Females, | 44 | |
| | | 217 |
| Age as follows: | | |
| Under eighteen years, | 30 | |
| Over eighteen years, | 187 | |
| | | 217 |
| Of the patients treated, there were— | | |
| Single, | 108 | |
| Married, | 80 | |
| Widowed, | 20 | |
| Not stated, | 9 | |
| | | 217 |
| Nationality as follows: | | |
| United States of America, | 85 | |
| Ireland, | 61 | |
| Wales, | 27 | |
| Germany, | 18 | |
| England, | 17 | |
| Sweden, | 3 | |
| Scotland, | 4 | |
| Island of Corsica, | 1 | |
| Canada, | 1 | |
| | | 217 |

Occupation as follows:

| | |
|---|---|
| Miners, | 60 |
| Laborers, | 57 |
| Domestics, | 22 |
| Housekeepers, | 9 |
| Slate pickers, | 9 |
| Driver boys, | 2 |
| Engineers, | 3 |
| Shoemakers, | 3 |
| Seamstresses, | 2 |
| Door-tenders, | 3 |
| Machinists, | 1 |
| Hostlers, | 2 |
| Car runners, | 2 |
| Farmers, | 3 |
| Carpenters, | 3 |
| Tramps, | 2 |
| Merchants, | 2 |
| Butchers, | 2 |
| Cabinet-maker, | 1 |
| Telegraph operator, | 1 |
| Waiter boy, | 1 |
| Doctor, | 1 |
| Blacksmith, | 1 |
| Mason, | 2 |
| Night watchman, | 1 |
| Fireman, | 1 |
| Canvasser, | 1 |
| Saddler, | 1 |
| Tailor, | 1 |
| Peddler, | 1 |
| Hotel-keeper, | 1 |
| None, | 16 |
| | 217 |

Average time in hospital of those discharged, . . . . . 36 days.

| | |
|---|---|
| Charity patients, | 199 |
| Pay patients, (so recorded,) | 18 |
| | 217 |

There were—

| | |
|---|---|
| Surgical cases, | 103 |
| Medical, | 113 |
| Obstetrical, | 1 |
| | 217 |

**Annual Statement of H. H. Derr, Treasurer of the Wilkes-Barre City Hospital, for the year 1879.**

*Dr.*

| | | | | |
|---|---|---|---|---|
| To amount received, | | State appropriation, | $8,500 00 | |
| Do. | do. | Central poor district, | 870 61 | |
| Do. | do. | Dr. Crawford, St. Patrick society | 8 00 | |
| Do. | do. | Pittston poor board, | 35 93 | |
| Do. | do. | R. Sharpe, junior, | 2 00 | |
| Do. | do. | C. Parrish & Co., | 20 00 | |
| Do. | do. | J. P. Dickson, agent, | 50 00 | |
| Do. | do. | Joseph Stickney, | 100 00 | |
| Do. | do. | F. Mercur, superintendent, | 82 25 | |
| Do. | do. | Warrior Run Knights of Labor, | 30 00 | |
| Do. | do. | Men and boys, Hutchinson mines | 79 00 | |
| Do. | do. | Edward Anhizer, board, | 18 00 | |
| Do. | do. | Hoffnung I. O. O. F., (C. Pister,) | 60 00 | |
| Do. | do. | Miss E. R. Mayer, treasurer, | 300 00 | |
| Do. | do. | J. P. D., | 5 00 | |
| Do. | do. | M. Long, board J. Becker, | 25 00 | |
| | | | | $10,185 79 |

*Cr.*

| | | |
|---|---|---|
| By Balance due treasurer, January 1, 1879, | $1,704 14 | |
| Salaries and compensation of matron, nurses, and servants, | 1,649 02 | |
| Medicines, | 846 87 | |
| Surgical instruments, | 491 19 | |
| Books, | 82 00 | |
| Maintenance of patients, | 3,286 75 | |
| Ordinary expenses, | 633 82 | |
| Extraordinary expenses—building, wall, trees, &c., | 1,007 25 | |
| | | $9,701 84 |
| Balance on hand, | | $483 95 |

**Contributors to Wilkes-Barre City Hospital, for the year 1879.**

*January.*—Delaware and Hudson Coal Company, Mrs. N. Rutter, Mrs. Moses Wadhams, Mrs. Charles Parrish, Dr. Spayd, Miss Doran, Mr. Constine, Mr. Loomis.

*February.*—Mr. Baker Hillman, Mr. A. J. Davis, Miss E. W. Mayer, Mrs. C. Parrish, Mrs. Amzi Fuller, Mrs. H. Doran, Mr. Puckey, Mrs. Ziba Bennett, Mrs. H. M. Hoyt, Mrs. C. F. Reets, Mrs. A. T. McClintock, Mr. Constine, Mrs. W. W. Lathrop, Mr. Mitchell, Mrs. C. Conyngham, Mrs. Osterhout, Mayor Loomis, Mrs. W. L. Conyngham, Miss Brower, Miss Doran, Mr. Yordy.

*March.*—Mr. James P. Dickson, Mr. J. F. Weller, Mrs. T. Blake, Mr. Constine, Mrs. Rieman, Mrs. Weller, Mrs. Charles Miner, Mrs. Judge Conyngham, Presbyterian Sewing Society, Memorial Church Sewing Society, Mr. Ben Dilley, Mrs. H. Wright, Mrs. Leavenworth, Mrs. Fred. Parrish, Mr. Mitchell, Mrs. Amzi Fuller, Mrs. Dr. Ingham, Mrs. N. J. Bruce, Mrs. M. Rieman, Mrs. N. Rutter.

*April.*—Mr. Joseph Stickney, Mrs. A. Merritt, Mrs. H. Palmer, Mrs. Weller, Mrs. Fred. Mercur, Mr. Calvin Parsons, Mrs. Charles Parrish, Miss Bristol, Mr. A. H. Schobert, Miss Wright, Miss Doran, Mrs. Patterson, Mrs. Mitchell, Mrs. Josiah Lewis, Memorial Church Sewing Society.

*May.*—Miss L. G. Brower, Mr. Marx Long, Miss Jane Miner, Mrs. Josiah Lewis, Mrs. Rieman, Mrs. Fuller, Mrs. Hosmer, Mrs. McClintock, Mrs. C. Wadhams.

*June.*—Rev. Father O'Haran, DeMunn Brothers, Mrs. C. Dorrance, Mrs. Calvin Wadhams, Mrs. W. Schrage, Miss Ella Harvey, Mr. Patterson, unknown.

*July.*—Mr. Yordy, Mrs McClintock, Mr. Cosgrove, Mrs. Moore.

*August.*—Mrs. Amzi Fuller, Judge Dana, Mrs. Charles Miner, Mr. Frank Stone, Mrs. J. V. Darling, Mrs. Rieman, Mrs. Welles, Mr. John Gallagher, Mrs. Lewis Paine.

*September.*—Mrs. Bowman, Mrs. Weller, Mrs. Dr. Mayer, Miss Mayer, Mrs. Harvey, Mrs. Leavenworth, Miss Bristol, Mrs. Henry, Wyoming; Mrs. Welles, Mrs. McClintock, Mrs. C. Dorrance, Mrs. Dr. Murphy, unknown.

*October.*—Mr. R. Morgan, Mr. J. W. Hollenback, Calvary Sunday School, Mr. T. Parker, Mrs. B. G. Carpenter, Mrs. A. H. Bowman, Mrs. Charles Miner, Mrs. A. T. McClintock, Mrs. H. Oppenheimer, Mrs. Neiier, Mr. Charles Becker, Dr. Shive, Mrs. Rieman, Mrs. J. V. Darling, Mrs. Charles Bennett, Mrs. N. Rutter, Mrs. Ross, Mr. Patterson.

*November.*—Mr. Payne Pettebone, Mrs. W. Schrage, Mr. Patterson, Mr. W. Tuck, Mr. Vaughn, Miss Fazer, Mr. George Parrish, Mrs. J. V. Darling, Mrs. E. H. Chase, Rev. H. L. Jones, Mrs. C. P. Hunt, Mrs. Dr. Mayer, Mr. Henry Keiler, Mr. John Mitchell, Mrs. E. H. Chase, Mrs. M. Rieman, Mrs. McClintock, Mrs. J. V. Darling, Mrs. C. M. Conyngham, Mrs. Allen Oliver, Miss Eleanor Welles, Mrs. Helen Stark, Mrs. Silas Alexander, Mrs. Seth Tuck, Mrs. C. Wadhams, Mrs. T. C. Harkness, Mr. T. Parker, Lehigh Valley Company, Mr. George Elston, unknown friend, Bennett & Walter, unknown, 'Mission Band' Memorial Sunday School.

*December.*—Mr. Hezekiah Parsons, Mr. Calvin Parsons, Mrs. J. H. Hildreth, Mrs. A. T. McClintock, Mrs. C. F. Reets, Mrs. Jonas Long, Mrs. G. Bennett, Mrs. C. M. Conyngham, Mrs. E. E. Rutter, Mr. Ben Dilley, Mr. Burgunder, Mr. Marx Long, Mrs. Ansbacher, Major Whyte, unknown, Mrs. Darling, Mrs. J. Miner.

**By-Laws and Regulations of the Wilkes-Barre City Hospital.**

*The Board of Visiting Managers.*—The visiting or lady managers are

elected by the directors of he hospital, annually, at their first meeting for organizing, and shall consist of twelve members, whose term of duty shall be three years, unless shortened by voluntary retirement. One third of the managers, consisting of those who have served three years, or the longest period beyond three years, shall retire before the annual meeting of the board of directors, and their places be filled by the election or appointment as above, of themselves or of new members.

2. The visiting managers are to have a general supervision of the aff irs of the hospital, and will be divided into committees, each consisting of two visitors, and serving two consecutive months during the year. The appointed members will visit the hospital twice in each week of their term, and as much oftener as they deem necessary.

3. They will ascertain the sanitary condition of the wards, inspect the kitchen, laundry, dining-room, cellars, and sleeping-rooms of the officers; examine and pass upon the accounts of the matron, and purchase or authorize the purchase of such supplies as are requisite for the daily use of the inmates.

4. They shall report to the attending physician or matron any abuses or infrac ion of the regulations or discipline of the house which they may have observed in the respective departments of these officers.

5. They may, under the direction of the treasurer, receive all moneys due the hospital for board of patients, and deposit the same with him, and obtain from him, and expend such sums as may from time to time be required.

6. They shall keep regular accounts of all moneys received and disbursed by them, and submit the same to the treasurer.

7. Upon being notified by the visiting physician of the admission of a paying patient, and the p_ice of the latter's board agreed upon, the visiting managers will endeavor to secure the collection of the amounts due from the person responsible for the same.

8. The visiting managers are empowered to use all honorable means towards raising funds for the support of the hospital, which accord with the views of the executive committee of the board of directors.

*The Medical Staff.*—The medical staff of the hospital, now consisting of two consulting and six attending physicians and one resident physician, are elected by the board of directors. Vacancies in their number shall be filled, or additional physicians appointed by the board of directors, only upon the recommendation of three fourths of the consulting and attending physicians.

*The Attending Physicians.*—1. The attending physicians shall have the entire direction and control of the medical and surgical departments; of the management of patients and the conduct of the nurses. They shall prescribe the diet for the patients, and give such directions to the matron as may be necessary for their health and physical condition, and shall see that these directions are carefully executed and their prescriptions and other treatment faithfully administered and carried out by the resident physician and the nurses.

2. The attending physician on duty shall be required to visit the wards of the hospitals at least twice in every week of his term, and as much oftener as the needs of the patients may require. In the event of his necessary absence from his duties, he must appoint as his temporary substitute another member of the medical staff.

*The Resident Physician.*—1. The resident physician shall be nominated by the medical staff, three fourths of their number voting in his favor, and elected by the board of directors. The term of his service shall not exceed one year, unless he be reëlected to the position. His appointment may be revoked for just cause at any time by the same vote of the medical staff.

2. He shall reside in the hospital during his term of office, and be provided with board, washing, and lights, free of charge.

3. His duties shall be assigned him by the attending physician, all of whose instructions and directions in regard to the care of the sick he must promptly and carefully execute. He shall visit all the patients every morning and evening and at other times when necessary, and be prepared to report their condition to the attending physician. In the absence of the latter and in emergencies he will prescribe for and treat patients requiring his attention.

4. He shall not leave the hospital during visiting hours, and shall not absent himself from his duties without the knowledge and consent of the attending physician. In the event of a prolonged absence, he must provide a substitute, approved of by the attending physician.

5. He will report monthly to the visiting managers the names, residence, and nationality of all patients received, discharged, or dying during the previous month.

6. He shall each day give to the matron the diet list prescribed for the patients. He shall see that the proper appliances be used, the medicines correctly compounded and faithfully administered, the suitable diet furnished, and that the treatment of patients by the nurses be kind, attentive, and watchful.

7. He must himself correct and, if necessary, report to the attending physician any irregularity or improper conduct on the part of nurses or patients.

8. He will attend the visiting physician in the latter's tour through the wards, and must give all needful instruction and explanation of their duties to the nurses.

9. All stimulants, narcotics, and other poisons must be carefully kept by the resident physician under lock and key.

10. The resident physician shall keep, for the inspection of the executive committee, a record of all patients, with their age, disease, residence, date of admission, and discharge or death, with the results of treatment, and such other particulars of each case as may be useful or interesting.

11. Upon entering on his duties, the resident physician shall give to the treasurer of the hospital a receipt for the books, apparatus, instruments,

and other property of the institution committed to his care. He shall keep a list of the same, and be held responsible for the avoidable loss of, or injury to, any such articles, accounting for said property upon his withdrawal from his position.

12. The resident physician shall not permit any apparatus, books, or instruments belonging to the hospital to be loaned or taken out of the building, excepting only for the personal and temporary use of members of the medical staff. In such cases the articles loaned must be returned as soon as possible and in as good condition as when taken.

*The Matron.*—1. The matron of the hospital shall be appointed by the board of directors, upon the recommendation of a majority of the visiting managers.

2. She shall have the general direction of all the employés of the hospital, excepting the resident physician and those immediately under the control of the attending physician, and shall see that the orders given by the physicians to the nurses are conformed to by the latter.

3. She will be responsible for the neatness and order of every part of the hospital; superintend and manage the kitchen, dining-rooms, laundry, officers' and servants' rooms, cellars and grounds, and the arrangements for heating and lighting, and have the care of domestic animals belonging to the institution. She shall see to the providing of suitable meals for the officers and employés of the hospital, and of the diet directed by the physicians for the patients.

4. The matron shall have control of every department of the hospital connected with the wards, both male and female, under the directions and advice of the physicians and visiting managers, and will be responsible for the neatness, order, and discipline of the wards, nurses, and patients. She will see that patients are provided with the food, and comforts necessary for their welfare, and directed for them by the physicians, and she will report to the latter any infraction of the rules, and any instance of disorder, or disobedience coming under her notice.

*Nurses.*—1. It shall be the duty of the nurses to give undivided attention to the care of patients, and to report immediately to the matron, the resident or attending physician, any act of disobedience, or of neglect to conform to the rules prescribed for the government of patients.

2. Nurses shall not, except under direction of the physician in charge, attempt to coerce or to discipline any patient, but shall treat those under their care with uniform kindness and attention.

3. They shall not absent themselves at any time from the hospital, without permission from the resident physician, and they must report to him upon their return.

*Admission of Patients.*—1. All cases of recent severe accident or injury occurring in the State of Pennsylvania, which are brought to the hospital within twenty-four hours after their occurrence, shall be admitted at any time of the day or night, if there be accommodations for them.

2. Other patients shall be received into the hospital, only with the consent of the attending physician, or with that of the resident physician, approved by the visiting one, either as paying patients, or as receiving gratuitous aid.

3. Those who are able to pay for their board, or to contribute towards such payment, are to be received at a rate to be determined by the attending physician, who will arrange the price of board, in accordance with the circumstances of each case, and the accommodations required, his decision being subject to the approval of the executive committee. The ordinary charge for board will be five dollars per week, which will include medical and surgical care, medicine, and nursing. An increased amount will be exacted from those able to pay, who require unusual attention or accommodation. Patients able to pay are expected to guarantee, through responsible persons or by deposit, a sum sufficient to meet their expenses while in the hospital.

4. Those applying for admission as non-paying patients, must present the certificate of one of the directors, lady managers, or medical staff, that they are really in need, and unable to pay for board and medical attendance, but in any case their admission must be with the consent of the attending physician, unless they be provided with a written order of admission, signed by three members of the medical staff.

5. Admission of non-paying patients to the hospital, shall be restricted to surgical cases, to those of acute disease, and to those of such chronic diseases as may be considered amenable to treatment in a period not exceeding three months.

6. No person suffering from infectious or contagious diseases, except typhoid fever, shall be admitted into the wards of the hospital, unless in the event of there being a special building for their reception.

7. Applicants for advice and treatment in the dispensary of the hospital shall produce satisfrctory evidence of their inability to pay for counsel and medicine.

*Conduct of Patients.*—1. Patients, upon admission to the hospital, shall deposit money, valuables, and extra clothing with the matron, who, if requested, will give receipt therefor.

2. Patients shall not leave the premises without permission from the resident physician.

3. Patients shall not enter the wards or porches appropriated to the other sex, the kitchen, cellar, yard, or apartments of the domestics, unless by direction of the resident physician or matron.

4. No ardent spirits or other stimulating drinks shall be brought into the hospital by the patients, or received by them, without the expressed order of the attending physician; neither shall patients be furnished with fruit or any article of food or luxury, without the knowledge and permission of the resident physician.

5. No loud talking, no profane or vulgar language, no unnecessary noise

or disturbance of any kind, will be permitted within the hospital, or on its grounds.

6. No patient shall smoke tobacco within the walls of the hospital, and spitting upon the floor or walls, and other practices inconsistent with neatness and cleanliness, are strictly forbidden.

7. Before lying down upon their beds, patients must remove their boots and shoes, and turn down the outer spread, and each patient will be responsible for the neatness of his bed when not occupied during the day.

8. All convalescent patients who are able, and not particularly exempted from such duty by the physician, shall assist in their respective wards when requested to do so by the nurses.

9. All patients must be in their respective places during the regular visit of the attending physician.

10. Patients shall retire at or before nine o'clock, P. M.

11. It shall be the duty of the resident physician and matron to enjoin upon patients a strict observance of the above regulations, and to report to the attending physician any patient who shall continue to violate them. In the event of persistent violation of the rules, or any gross act of disobedience or disorder on the part of a patient, the attending physician may immediately discharge the offender from the institution.

*Visitors.*—1. No visitors, excepting officers of the hospital on duty at the time, will be allowed to see patients, without the express consent of the attending physician, nor unless between the hours of two and five, P. M., on Tuesday and Friday. This regulation will not be considered as applying to clergymen visiting those in need of their ministration. Clergymen will be welcome at any time, if their visits be desired by the patients, and not considered injurious to the welfare of those upon whom they call.

2. No visitor shall remain more than one hour with a patient, without the consent of the attending or of the resident physician, and all visitors must leave the wards upon the entrance of physicians upon their tour of duty.

3. No visitors to patients in the hospital shall be permitted to suggest or advise for them any treatment or regimen, or to take into the wards any article of medicine, diet, drink, or luxury. No loud conversation or singing with patients will be permitted, excepting in private rooms, without the express consent of the physician.

4. All eatables, bottles, or packages of any kind, intended for patients, must be left with the resident physician or matron, marked with the name of the patient. After the visiting hours, these will be examined by the medical officer, and, if not found objectionable, will be delivered to the patient.

*The Training of Nurses.*—The visiting managers of the hospital being desirous of affording to its inmates and to other sick persons who may be indirectly benefited by their proposed course, the advantages to be derived from the residence in the institution and among our community, of a corps

of trained nurses, have established, with the consent of the board of directors, the following regulations in regard to a system of instruction for those who desire to become competent nurses:

1. Arrangements have been made for giving, at the hospital, to the number of suitable applicants who can be accommodated, one year of education and training to women who intend to become professional nurses. Those who wish to receive this course must apply to the board of physicians, and upon the approval of the latter, will be accepted as pupils in the art of nursing in the hospital.

2. The candidates must be over twenty and under forty years of age; of sound health, and of irreproachable character, as certified by some responsible person.

3. Successful applicants will be received on probation for the term of one month. If permitted to continue, after the expiration of the month of trial, they will be expected to remain during the rest of the year, and to perform in that time all the duties required of nurses, receiving their board and instruction free of charge, but no compensation, excepting for night nursing or for acting as substitutes for absent regular nurses. The physicians of the hospital will have full power to decide as to the fitness of the nurses for their duties, and as to the propriety of retaining or dismissing them at the end of the first month. The same authority can dissmiss them at any time in case of misconduct or inefficiency.

4. The matron will be the nominal head of the nursing corps, and their government, excepting that of discipline and instruction, which is directly under medical authority, will be under the control, subject to the direction of the visiting managers.

5. The nurses will reside in the hospital and serve in the wards, receiving a course of instruction from the physician and matron, obeying the directions of these officers in all respects as if they were the regular nurses of the hospital. Before entering upon their duties, they will bind themselves by a written agreement to remain in the hospital during one year, and to conform in all respects to the rules of the institution.

The course of training and instruction of the pupils will include:

(1.) The dressing of burns, blisters, ulcers, and wounds; the preparation and application of bandages, blisters, fomentations, plasters, and poultices, and the method of cupping and leeching.

(2.) The administration of enemeta, and other injections, and the use of the female catheter.

(3.) The best methods and appliances of friction and of massage, and the application of the electric current.

(4.) The management of helpless patients, the prevention of bed-sores and chafing, the best methods of moving, making beds and changing sheets and clothing, of giving baths in bed, and of managing position.

(5.) A full knowledge of the dietary of the sick, taught both in theory and by practice, and the best methods for securing cleanliness, ventilation, and disinfection.

(6.) The mode of making and of reporting observations upon the condition of the secretions, expectoration, pulse, skin, tongue, temperature, respiration, and intelligence; the condition of ulcers or wounds, and the effect of diet, stimulants, or medicines.

6. Instructions will be given by the attending and resident physicians at the bedside of the patient, and in other ways; also, by the matron and head nurse, and opportunities offered to the pupils of practicing all the methods of this art.

7. While in the wards of the hospital, the pupils will wear a uniform dress, consisting of calico dress, white apron, and cap.

8. Upon the expiration of the year of instruction, each pupil who shall be adjudged by the medical board of the hospital to be qualified for the position of "trained nurse," will receive a diploma, certifying to her fitness for the title, her ability, and character.

**Constitution of the Wilkes-Barre City Hospital.**

ARTICLE I—*Name.*

A. C. Laning, Charles Parrish, Hendrick B. Wright, L. D. Shoemaker, Calvin Wadhams, A. T. McClintock, William L. Conyngham, S. L. Thurlow, E. L. Dana, John Welles Hollenback, Charles A. Miner, E. P. Darling, Stanley Woodward, W. F. Dennis, M. D., J. H. Swoyer, F. Mercur, John Reichard, John C. Phelps, Washington Lee, George S. Bennett, Henry M. Hoyt, T. S. Hillard, William V. Ingham, George H. Parrish, William W. Neiier, M. B. Houpt, Walter G. Sterling, Thomas Long, Herman C. Fry, Charles F. Reets, Paul A. Oliver, E. R. Mayer, M. D., George R. Bedford, R. Bruce Ricketts, Henry H. Derr, John T. Griffith, Ziba M. Faser, John Lynch, Edmund G. Butler, Jonathan E. Bulkeley, M. D., Henry Ansbacher, Ira M. Kirkendall, E H. Chase, and William R. Maffet, all of the city of Wilkes-Barre; Payne Pettebone, of Wyoming; John B. Smith, of Plymouth, and A. J. Pringle, of Kingston, all citizens of the State of Pennsylvania, and their associates and successors, who shall also be citizens of said State, are hereby incorporated and made a body politic, in fact and in law, by the name, style, and title of THE WILKES-BARRE CITY HOSPITAL.

ARTICLE II—*Corporate Power.*

The said corporation, by the same name, style, and title, shall have perpetual succession, and be able to sue and be sued, to plead and be impleaded, in all courts of law, and elsewhere, to have and make a corporate seal, and again, at pleasure, to alter and renew the same, and shall be able and capable in law and equity, to take, purchase, hold, and receive, to them and their successors, any lands, tenements, goods, and chattels, annuities, and moneys, which are now, or shall, or may, at any time hereafter, become the property of said corporation, by purchase, gift, grant, bargain, sale, conveyance, devise, bequest, or otherwise, from any person or persons

whomsoever, capable of making the same, and the said lands, tenements, goods, and chattels, to grant, bargain, sell, convey, improve, or dispose of, for the use and benefit of said corporation: *Provided*, That the net yearly income from the real estate of said corporation shall not exceed the sum of $20,000.

ARTICLE III.—*Object.*

The object of said corporation shall be to relieve human suffering, by mistering to the wants of the sick and injured who may apply to it for relief, without distinction of race, creed, color, or condition, and by receiving into its wards and under its care all sick or injured persons whose circumstances will permit them to be admitted under such rules of admission as shall be adopted by the board of directors: *Provided*, That, should there not be room in the wards of said hospital for all claimants for admission, the preference shall be given, first, to those nominated by donors or contributors to the funds of the same; secondly, to residents of the city of Wilkes-Barre; thirdly, to residents of the county of Luzerne, in said State.

ARTICLE IV.—*Members and Directors.*

The members of said corporation shall consist of those of the above named corporators, who shall have paid into its treasury, previous to the first election of directors, the sum of five dollars or more, and who shall continue to pay the same sum, annually, and of such other citizens as shall be elected members by a vote of the board of directors, or by a committee of the same, appointed for this purpose, and who shall, annually, pay into the said treasury the said amount or more.

The payment of the sum of five dollars by any corporator or elected member of this corporation, shall entitle him to one vote at the election for directors of the same, or upon any other business properly submitted for the action of the members, at any meeting held during the year for which said contribution is paid, and each additional five dollars paid by such corporator or member, shall entitle him to an additional vote. Should any member give or bequeath to said corporation, real or personal estate or fund as a gift, devise, or endowment of a permanent character, for its use and benefit, said donor, or his executors or administrators, or one of them, shall, if a member or members of said corporation, be entitled to cast as many votes at meetings of said members as will be the equivalent of the number of said sum of five dollars contained in the annual interest of the amount of said gift or devise, at the highest legal rate of interest of the Commonwealth of Pennsylvania.

The corporators of said hospital, shall, as soon as possible, after the decree of corporation and after three days' notice, signed by a majority of said corporators, and published in two newspapers issued in the city of Wilkes-Barre, assemble together and proceed to elect from among their number by ballot and by a majority of the votes cast, twelve persons as directors of said corporation, who shall continue to hold their offices as

hereinafter mentioned, and who shall be empowered and obliged to perform the proper duties of the position.

The board of directors thus appointed, shall, as soon as possible after their election, hold a meeting and divide themselves, either by mutual agreement or by lot into three classes, each consisting of four members, one of which class shall continue in office during one year from the time of the first election, another two years, and the third three years from the same time.

At the expiration of one year from the time of the first election of said board of directors, and yearly thereafter, upon the same day, or upon a day occurring within a week from said day, and to be decided upon by the said board of directors, the members of said corporation shall assemble together and elect from among their number, by ballot and by a majority of the votes cast, the four directors, whose term of service, according to the above mentioned arrangement, is to continue during one year, from the date of such annual election.

In the event of charges of improper conduct being brought against any director or member of said corporation, the same shall be duly investigated by the said board of directors, and the said director or member may, after fair hearing and trial before said board, be expelled from membership or directorship, by a two thirds vote of all the members of said board of directors.

### Article V.—*Officers.*

The said board of directors shall, within ten days after their own election, and annually thereafter, meet together and elect by ballot, from their own number, a president, a vice-president, a treasurer, and a secretary, (the last two offices may be held by one person,) who shall hold their offices until the next annual election, and at the same or at another meeting of the directors, a superintendent or matron, or both of these, a nurse or nurses, and any other officers whom they may deem it necessary to appoint, shall be elected by ballot, and by a majority of the votest cast.

### Article VI.—*Medical Staff.*

The medical staff of said hospital shall consist of three, or of a less number of consulting physicians, who shall be *ex officio* members of the board of directors, and of as many attending physicians and surgeons as, in the judgment of said directors, may be required for the service of the hospital.

### Article VII.—*Loans.*

No funds of the said corporation shall be loaned to any member of the board of directors, and the same shall not be used for any other purpose than the maintenance and benefit of said hospital.

### Article VIII.—*By-Laws, &c.*

The board of directors shall have authority to make, execute, and enforce such by-laws, rules, and regulations as they shall deem necessary for the

well ordering and conducting of the concerns of the said corporation: *Provided*, That the same be not repugnant to or inconsistent with the constitution or laws of the United States or of the State of Pennsylvania, or with these articles of incorporation.

ARTICLE IX—*Amendments.*

Applications for amendments to this charter may be made to the court, as provided by law whenever the same shall have been directed by a majority of the board of directors.

**Relief Fund for the Employees of the Lehigh Valley Coal Company, in the Wyoming Valley, Pennsylvania.**

It is proposed to establish, by voluntary contributions, a fund for the relief of the employés of the Lehigh Valley Coal Company, who may be injured, and the families of those who may be killed, while working at the several collieries of the company.

The proposed plan is as follows:

*First.* Every person employed in any of the collieries, both outside and inside, may contribute to the fund *one day's wages*, by making application at the office to so contribute for the year, and the company shall contribute an amount equal to that contributed by all the employés; and contributors *only* shall be entitled to the benefits of the fund.

*Second.* The fund thus raised shall be kept in the name of the company, and be subject, at all times, to the drafts or orders made thereon, in pursuance of the objects for which the fund is created, by the persons authorized so to do.

*Third.* The foreman at each colliery, together with two employés, to be selected by the contributing employés at such colliery, shall form a committee whose duty shall be to report to the superintendent of the company, upon blanks, signed by at least two of them, every case entitled to the benefit, with the date and nature of the accident; and in case of accidents not resulting in death, to notify the superintendent, when such relief shall cease; no money shall be paid out of the fund except upon a written order, signed by the committee or the foreman, and one other member.

*Fourth.* It is proposed to apply, out of the fund, such amount as the company finds necessary, to secure sufficient accommodations at the Wilkes-Barre hospital or St. Luke's hospital, Bethlehem, for those who may wish to be treated there.

*Fifth.* The fund shall be applied to those entitled, as follows: In cases of accidental death, fifty dollars shall be paid for funeral expenses; three dollars per week shall be paid to the widow, for the period of one year, provided she remains unmarried during that length of time, and one dollar per week to each orphan child under twelve years of age of the person so killed, for the period of one year, unless otherwise cared for. In cases of accidental injuries, not causing death, six dollars per week shall be paid to each man during his disability to work, and three dollars per week to each boy

under sixteen years of age, during the period of three months, if necessary, but not longer, except on unanimous request of the committee.

*Sixth.* In case such injured person shall require medical treatment at the Wilkes-Barre or St. Luke's hospital, Bethlehem, and shall himself desire to be treated there, it shall be the duty of the committee, or any two of them, to make an order for his maintenance and care at said hospital, and deliver the same to the superintendent.

*Seventh.* None but contributing employés, who, while performing their duty at said collieries shall have been accidentally injured, and the families of contributing employés who have been accidentally killed while engaged in the work of the company, shall be entitled to the benefits of the fund. A list of the contributors shall be kept posted at each colliery.

The foregoing plan will be pursued for the year . . ; at the end of which time such changes and alterations will be made as experience may prove to be necessary.

### Mine Fires.

The old Baltimore mine is still burning, and my remarks thereon, in my last years' report, need no modification or addition.

The Empire or Kidder slope fire is also in about the same condition as last reported, the surfaces caving in, in small sections, occasionally, which have to be filled up to prevent the admission of atmospheric air to the smoldering fire.

Audenried Colliery.—On the 6th day of May, about midnight, the fire that had been discovered there about noon of the same day, was considered to be too far gone to successfully subdue it, unless by the great risk of doing so when it was known that there were some fifteen or twenty chambers to the west of it, and immediately connecting with it, full of explosive gas, and subject to explode at any moment. Having been notified of the case about eleven, P. M., of this day, I immediately proceeded to the mine, and there met Messrs. F. B. and G. H. Parrish, superintendent and assistant superintendent for Charles Parrish & Co., Mr. J. Harris, engineer for the receivers, and others, at the shaft-head. We soon descended the shaft which is nearly nine hundred feet in depth, and we had just reached the fire-boss's station or room, and were preparing lamps, and looking over the mine tracing preparatory to going to the scene of the fire, when a messenger brought the sad news that a large party of workmen, at the fire, were very seriously burned while applying the water hose. The whole party started, accompanied by this time by Mr. Smith, mine foreman, and we soon met the unfortunate victims being conducted out by their comrades as best they could, eight of whom were seriously burned, so much so, that six of them succumbed to an untimely death after days and some of them weeks of excruciating and indescribable pain and suffering.

As soon as it was ascertained that all the victims of the disaster were brought out, a consultation was held, and all further efforts to put out the fire by the hose was at once abandoned, and the mine ordered to be flooded,

and in a short time the water from the Empire mine was turned into the Stanton colliery, and about the second day, the surface water or creek was also turned into it.

The next day I requested the outside foreman, Mr. Thomas Wagner, to close up every opening around the shaft-head, and it was so done, except the door into the room of the Bull pump engine, which had a lock on. I forbade him and Mr. F. B. Parrish to let any naked lights or fire go near the shaft-head, and Mr. Parrish assented. I also personally assisted in extinguishing the gas-burners used in the hoisting engine-room, and the night watchman was to have no lantern or other naked light around the shaft-head. On Sunday morning, May the 18th, about two-fifteen, A. M., the coal breaker of the Stanton or Audenried colliery was discovered to be on fire by the night fireman, the watchman being at the time in the engine-room at his supper. By five o'clock, A. M., the mammoth structure had been reduced to ashes, molten metals, and other debris. The flames were first observed breaking out in the northwest corner of the head-house, near the ground floor, having been ignited, apparently, from inside, by what means is not known. Various theories have been advanced to account for the origin of the burning of the breaker, such as ignition of the same by fire from the burning mine; then incendiaryism, which had its origin in the thoughtless and meaningless remarks of some of the bystanders during the burning of the great breaker. The idea of fire in the mine igniting the breaker, could only be entertained by those that knew little or nothing about the place, as there was about forty feet of water in the shaft when it occurred, hence the same could not have happened.

In my opinion, the most plausible theory is this: That the fire was caused by spontaneous ignition of inflammable materials in the said head-house, such as old waste used about machinery, or other old cotton goods, or parts of garments. On the night of the sad catastrophe, when the eight men were burnt, they were all brought into the pumping engine-room, and there were dressed with cotton waste, saturated with linseed oil, and whatever else could be had conveniently to tie them up with, before putting other garments on them, such as quilts, &c., when conveyed from there to their homes. Their old garments, partially burned, were taken off and left there, all of which, it was said, had been carefully put away. But we know that the whole floors were saturated with oil that night, unavoidably so, and it is hard to say positively, that some of the said oil, or other oiled garments in or around the said engine-room or one of the other two rooms, did not contribute to the origin of the great fire. Yet we have no positive proof of this, but I prefer this to any other theory advanced that I know of.

But to proceed with a history of this case, I would say that the water was supposed to have reached a height sufficient to have covered the locality of the fire by the first of July, and they had prepared a temporary head-house and sheaves, and got their engine, which had been considerably damaged by the fire, repaired, and ready to hoist water by two large water

tanks, each holding about eleven hundred gallons, and finally they began hoisting and started their pumps, and succeeded in reaching the bottom about the first of October. The mine was found to be in extrordinary bad and torn up condition, the water having caused the fire-clay underneath the seam to heave, and the roof in many places had caved in, and the timber so far as could be seen along the lower gangway and air-ways were generally destroyed. At the inner section of the northwest gangway, a terrible explosion must have taken place since the water had been first turned into the mine. The timbers were blown down, and mine cars were all destroyed, and scattered along the main gangway for a long distance, the cars so broken up that nothing but the fragments could be seen of many of them, and the timber being last put in place, being a new section of work, were blown down in every direction, but not broken. From the gangway up to the chambers the gas was full, preventing any further exploration. These explorations were made by the new mine-boss, Morgan R. Morgan, and his assistants.

The cleaning up of the mine along the main air-way and gangway was began, and preparations to restore the ventilation as soon as possible was in progress, when, on the morning of October 17, the mine boss, and his fire boss, Richard Lloyd, discovered that the mine was still on fire, burning down to the level, at the extreme northern end of the new tunnel. This was rather a severe shock, as every person entering the shaft had been supplied with a locked safety-lamp, and no other light, matches, pipes, &c., were allowed to be in their possession, as it was well understood that the whole mine was full of explosive gas, and that all it required was the work of a single spark or flame that would ignite gas, to explode the whole magazine, with its horrible results, as there were some fifteen or twenty persons then at work in the mine. However, the men were quietly informed, that for that day, there would be no more work, and that those desiring might take with them their few working implements which they had there, and thus they were safely withdrawn, not knowing for what cause until they reached the surface, when their situation was made known to them, and the reader can better imagine, than the writer can describe, their feelings under such circumstances. Immediately the writer was sent for, out of the Empire or adjoining colliery, happening to be in the Hillman seam at the time, and intending to go into the Audenried colliery after dinner. Subsequently, the men from No. 5 slope, the next lift of Empire works adjoining, and connected to the Audenried workings were withdrawn in a quiet and careful manner, not informing them of the possible danger of an explosion in the Audenried colliery, for fear of their getting panic stricken, and injure one another in their fright.

In a very short time, less than seven hours, the water was turned into the Audenried shaft, and has been filling gradually ever since, except the surface water has been turned off. A new air-shaft has been commenced north-west of the present shaft, and about a thousand feet from the end

of the new tunnel. The said shaft is to be twenty-six feet by twelve feet, and will probably be seven hundred feet in depth. A large fan, of the Guibal pattern, is to be erected over or near it, of thirty-five or forty feet diameter, and no work, except taking out the water and what work will be necessary to make the connection, will be done in the old shaft workings until the said fan is erected and in operation; at least, that is what is now in contemplation. In the meantime, a bore hole is being put down to tap the condensed air from the air chamber, or dome, of the anticlinal, which kept the water from reaching the fire when the water was in the mine the first time. This will insure perfect safety from any possibility of a fire being in there when they have taken out the water next time.

I would state that, up to the time of the mine fire, no permanent system of water supply to extinguish a fire had been arranged; but a temporary supply was secured when the mine took fire in May, in a few hours after it was discovered, by using the gas pipes employed by Mr. Robert Looney, to convey air to his receiver and machine rock-drills from the compressor on the surface, by connecting to the pump column. The pressure was so great that the receiver was exploded, and several other mishaps occurred, which helped to delay the getting of a supply of water. The balance of this subject will be treated under the head of the accident.

#### Diamond Colliery.

On the 9th day of May, a fire took place in the above mine, in the face of the west No. 3 gangway, and not having any water works to operate on it, it took several days and nights of labor to quench it, with all the force they could bring to bear upon it, having to haul water from the shaft foot in barrels, and forcing it on, sometimes by a hand pump, then again by using pails or powder kegs, as best they could.

As soon as the fire, which was started from a feeder igniting from a blast, got very strong, the air current was affected so much that a large quantity of gas had accumulated along the top part of the gangway. This was caused by the air traveling in the wrong direction, being forced first through the chambers, and returning through the air-way below the gangway.

#### Mine Caves.

Many caves have taken place in this, like every other mining district during the last ten years; some to the extent of twenty or thirty acres of surface, others bringing in the canal, &c., but on the 23d day of April, 1879, a caving in of the Sugar Notch, No. 10, colliery's slope workings took place, when seven human beings were entombed, which created great excitement, and which did not abate until the glad tidings of their almost incredible rescue was received and the prisoners permitted to relate their awful tale of suffering and experience under the strange circumstance. It occurred as follows:

The seam operated is known hereabouts as the Abbott seam, and by others as the Kidney seam, being the next workable seam overlying the

Hillman or Primrose seam, having about five feet and a half of good coal there, one foot three inches of bone coal, and on that a bed of fire-clay about ten inches; then bone and slate in thin and alternate layers for eighteen to twenty-four inches; then a fine-grained carbonaceous slate, in thin beds, from three to five inches thick, and every few feet apart are other cleavages at right angles to those of the plane of the seam. And here it should be stated that each of these cleavages in either directions parallel to and vertical to the seam, are as smooth as if polished with an ivory wheel, and then greased with plumbago, so that there is scarcely any adhesion in the slate and not much tenacity, as the vertical cleavages are so near each other and the flags so thin. The angle of dip varies from about fifty to probably fifteen degrees in different parts of the mine, the same decreasing going eastward until the spoon end of the basin is reached; then another sharp pitch is met, rising in opposite direction to the slope which was sunk on the north dip. The slope is down about six hundred feet on the pitch, and about four hundred and fifty feet vertical, more or less. There is another slope sunk several hundred yards east of the first mentioned, diagonally along the pitch, from which three lifts or gangways were in operation to reach the coal in the upper and flatter, consequently longer range of coal field in the eastern end of the basin, below all of which was the eastern gangway from the lower slope, which swung around the basin end back to the west.

On the 22d day of April, Mr. William Hosking, the mine boss, suspended mining in the third lift in the new slope, after about nine o'clock, A. M., because, as he said, a piece of rider coal had fallen in one of the chambers discharging some props, and rushing into the main gangway to the extent of nine or ten car loads of the same, when he put men there to clean up and set some timber. Right here I think it best to give the statement sent to me by Mr. Hosking, in reply to a series of questions which I had sent him shortly after the occurrence, which is as follows:

Sugar Notch, *May 16, 1879.*

T. M. Williams, Esq.,

Dear Sir: I received your letter, and will, to the best of my ability, give you all the information I can relating to what you ask of me, or, in other words, the caving in of our mine.

*First.* The names of the men walking with Steven Kerrighan when he was killed were Edward Price, Bernerd Reiley, Anthony Kane, and Patrick Lenahan. You saw and conversed with Price, Reiley, and Lenahan, (relating to the case of S. Kerrigan.) Price and Reiley were two of the seven men that were stopped in time of the cave. At four o'clock, A. M., on the 14th day of April (the day Kerrighan was killed,) Patrick Convery, the fire-boss, went in that way, and came out about six-thirty, A. M. John Wallace and his laborer, Anthony Lenahan, went in after the fire-boss came out, and before Kerrighan went in. Anthony Kane you did not see (meaning in the inquiry into Kerrighan's case) when you were here. The reason

for it was that he was hurt on the back and foot by the same lump of coal that hit Kerrighan, but he was all right at the time of the cave, for he worked trying to get the men out.

*Secondly.* The names of the timber-men working at props? I had two parties of men, three men on company work and four men on contract. Their names are Thomas Fulton, William Lloyd, and Frank Sorber. Names of contract men, John Montjoy, William Jones, Daniel Herron, and Patrick Brennan.

*Thirdly.* Date of commencing to timber. I started the company men to prop on the night of the 16th of April—the day you were here, and on the 19th I started the contractors at propping, with the company men, and at the same place. The company men worked five shifts at the props and the contractors three shifts.

*Fourthly.* The number of props put up were twenty-five, as near as I can get at it. We had to cut coal to get place to put them in, because the rib was low down towards the track.

*Fifthly.* What was being done on the new slope and east lower gangway the day preceding the cave? We worked the two upper lifts of new slope only from about nine o'clock, A. M., that day. The reason of not working the lower lift after that time was this: A piece of blacksmith coal fell in one of the chambers, and knocked out the props, and the stuff rushed down into the gangway about ten car loads of it, and we had to clear it, and prop it to work next day. In the east lower gangway, there was nothing wrong there at all. We worked there all day the same as usual. After the new slope quit work, I went through it, and the second lift was working or cracking, and I followed it down through the back branch—the location of this branch is between the second and third lifts in the new slope—and, as I went lower down, it did not work so much. I then went in as far as the air-bridge, and it did not work any there at all. So then I thought it a local affair—a fall, perhaps, in some three or four chambers. I thought, which we all know here, that this coal is always working and spaling; besides, the roof is so rotten here. Then I went down the manway to the lower lift, and everything there was as still as usual. I left a driver and his team and trip of cars pass me. The driver's name was John McGuire. I then came out through the gangway, and there was nothing unusual at all from former times. I came on to the top of the old slope, and there saw Richard Faull, the night chargeman. I told him to take the company men away that were propping on the lower gangway, and leave the contractors finish the rest of the job, and to put the company men on the new slope, lower gangway, to clean the remainder of the fall of blacksmith, aforementioned, that had fallen about nine o'clock, A. M., of the same day. Also, to put four props in place there, so that we might be able to work on the next morning. I also told him to go with them, and tell them what to do, and then to take, or make, his round, (a general examination,) and, if there should be any trouble, to send out the men, and to take out the mules with

them. Neither them nor I thought of any such a thing as a cave, for all the carpenters left their tools down in the lower lift of the new slope. Andrew Hoffman has about fifteen dollars worth there. Samuel Lewis about ten, and my son about seven dollars worth, each, So you can see that we anticipated no trouble. I then went home. The duty of the night chargeman was to look after the company men, and had charge of the gangways from faces to the slope. Had charge of the pumpmen and fanmen and engineers and fireman; besides, to get everything ready for work in the morning. If there should be any trouble or falls on the gangways, he was to take the company men to attend to it at once, and repair as soon as possible. When we had no one at this job, I was up day and night almost, for, if any trouble would take place, I was called sometimes two or three times in one night, and, for this reason, we gave the night chargeman full control of the night shift. He is a miner. Was a mine boss at Ashley colliery and at Jersey colliery for this company.

*Sixthly.* How many persons were employed during the night shift (on night of cave)? Four men on new slope, cleaning the fall of Blacksmith, and timbering, as aforementioned. Their names are Thomas Fulton, Joseph Williams, William Loyd, and Frank Sorber. On the lower gangway were eighteen persons, including a driver-boy and door-boy. Four men were propping that place you told me to timber on the 16th instant. Names of men, John Montjoy, William Jones, Daniel Herring, and Patrick Brennan. About twelve hundred feet further in were three more men cutting through a pillar for a branch—the place you saw the dead mule after the rescue. Names of said men, William F. Reese, Denis Gallagher, and John Leith. Inside of them about three hundred feet were two other men fixing the track and cleaning it. Their names are Martin Lee and Patrick Devany. Then about two hundred feet further in than the trackmen were three more, named Hawkins, Price, and Reiley. They were repairing the gangway, had to put up two sets of double timbers as relief timber, which I had ordered them to do two days before. The two first named persons had the gangway by contract. Then in the face of the gangway were two more, named Patrick and John Green, two brothers, one a miner and the other a laborer; they were working for Hawkins and Price. In the face of the air-way were two more men, named John Cattroll and Patrick McGinty, and, in addition, were two others, William Kenney, a driver-boy, and John Clark, a door-boy, thus making in all down in this lift, eighteen persons.

At twelve o'clock, midnight, Richard Faull, the night chargeman, went in along the east gangway of the old slope, and he thought all was right. He then went up to the new slope, to see the other men working up there, and from there he went outside.

*Seventhly.* What was the condition of the place at the time I left for home? The lower lift in the old slope I thought safe, and the lower lift in the new slope, also the upper lift in the new slope, but I thought we would

have a fall on the second lift of the new slope, in two or three chambers, which I thought might do good, but did not expect it so soon, for you could not see a prop breaking anywhere in the mine, not even in the second lift, nor up in the chambers, where I expected the most trouble from.

*Eighthly.* State whether at any time had any person or persons suggested or stated that they anticipated danger from a cave? When I was going through about noon, James Geaharty and Patrick Neelon were up on the back branch. I passed on down to the gangway, and they came after me and asked me to come up to the said back branch, that it was working bad, and I went with them, and I could not see a prop breaking nor a piece of coal falling where Neelon was. There was a pillar taken out on the lower side side of it, and I thought the working was caused by a bone over-head, it seemed to me all right. Those two men were all that I know of that said anything to me personally about it, and, as far as I know, no man anticipated any such thing as a big cave. All over this part of the mine the roof is rotten, and no one thought that it would make a general cave. Edward Price (one of the men shut in) told me that he was out through the lower gangway at twelve o'clock midnight, as far as the foot of the old slope, for his timbers, and he then passed the remarks "that he never heard the gangway so still in his life," and he has worked here many years.

*Ninthly.* When was pillar robbing commenced here? In May, 1878, on the upper side of the back branch, and above the second lift in the new slope. There were fifty feet of a pillar left both above and below the gangway, making one hundred feet of gangway pillar support. Officers consulted were as follows: Mr. Joseph Harris, mining engineer for the receivers, Mr. F. B. Parrish, mining engineer and assistant superintendent for Charles Parrish & Co.; also, William F. Smyth, mine foreman for Charles Parrish & Co., and Mr. Dodge. They all said this place would never cave, for it will fill itself, &c., and I thought so myself. Some time afterwards, Mr. Smith came around again, and told me to take out the pillars, and Mr. F. B. Parrish told me to cross each pillar on my map, so they could see to do the same at the Empire office, on their map. Thickness of seam, including coal, bone, and slate, eleven feet four inches; distance from seam to small dirt seam is eighteen feet, which is one foot thick, and from said dirt seam to hard rock, twenty-five feet of very shaly rock and slate, full of slips; thus making over forty feet of material hard to keep up.

Yours truly,

W. H. HOSKING.

The above answers will probably give a better idea of the circumstance than I could otherwise have given; yet there are a few items that need to be mentioned here to enable persons not familiar with the case to fully understand even the full text of the above answers.

On the 14th day of April, a man named Stephen Kerrighan, while in company with several others, was walking along the main east gangway, in the old slope, to go to his place of work, and, from the testimony of those

with him, suddenly a piece of fire-clay and bone fell on him, crushing and injuring him fatally on the spot; and on the 16th of the same month, I went there to inquire into the cause of the accident, and, as I mostly do whenever an accident of a serious or fatal nature occurs, if I have not made examination of the said mine within four or five months, more or less, then I try and do so the same day that I examine into the cause of the accident, as the day is broken, and will not be able to go to another mine and make a full examination, and in that way a day's work of examination would be lost; provided, that the case is such that it can be so attended to. If I did not so act, I could not get around as often as I do. I would also state, that on the day of the accident I was in the Empire colliery, and while there, a miner named McLaughlin was fatally injured by fall of a piece of coal, while the mine boss and I were just getting to his working place, and we helped to get him into a car, and he was taken out by his fellow workmen, in a dying condition.

The same afternoon, I received reports of two other fatal cases; one, the first, at the Henry colliery, and the second at the Sugar Notch colliery, so that the next day I went to the Henry colliery, but sent a telegram to Sugar Notch, stating that I could not attend there before the following day.

When I arrived at Sugar Notch colliery next day, I met the mine boss, and we immediately descended the slope, and went along the lower east gangway in the old slope to the spot where Kerrighan was fatally injured, and after the examination, I told the mine boss that I thought it advisable that he should have some timber put up along the said gangway for fear of further pieces falling from the upper side, the ground pitching considerable at that point, and had not the slightest thought of a crush being there. Mr. M. L. Tiffaney was also with the mine boss and me at the time. I then proceeded further into the mine, where I met John Wallace, a miner, who had just passed the same spot where Kerrighan was struck a few moments before him, and he stated that he had not heard anything working nor seen anything fallen on the road the whole length. I also saw two other men who were within a few feet and in advance of Kerrighan, and a third a few feet behind him, neither of whom had heard or seen any sign of anything falling or working. I then went to the extreme western end of the gangway and commenced my examination of the working faces, the mine boss accompanying me through some thirty places. I found the ventilation pretty fair, and no cause of complaint, except that several parties were neglectful about their powder boxes, and some badly set timber. I then learned that there would be no work there after dinner, and it was then nearly noon, so I told the boss that I would not go up to the new slope workings that day, as they were going to quit work, but would go over to the other side and see their new tunnel then being driven, and would go through the new slope workings the same day that I would go through and examine the west side. So after having examined the air connections, &c., in their new tunnel, we ascended the slope, being now after dinner. The

above is all I know regarding the condition of the Sugar Notch colliery up to the time of the cave. One rule I have adopted regarding examinations is this: never to examine a mine when not in operation, and that was one reason why I did not go to the workings of the new slope from the lower slope workings, as I usually did, through a man-way or traveling road made for traveling purposes, which reached all the way from the lower lift to the surface. If there was any sign of work from the lower lift up, I might have seen it had I gone up that way, or had I been informed that such was the case. A great deal of criticising has been done in this case by different parties, some through malice and others for their selfish political or other interest, and others in their ignorance, some saying I had been warned of the danger, and that the workmen had called my attention and that of the mine officers to the threatening condition of the mine. I deny any and all such charges, and declare them as lies made up of whole cloth so far as I am concerned; and Mr. Hosking has given his side of the case, which, to say the least, appears simple and candid. The case was one of the most strange that could be thought of, to think that a seam of five and a half feet of coal, besides the bone and fire-clay, and having such slaty and friable roof, should act as it did.

In the first place, it is stated that all the pillars that had been taken out were the center blocks, leaving about fifty feet of pillar above and below them untouched, thus leaving about one hundred feet of pillar on the gangways of the new slope, and fifty feet on the upper side of the lower gangway, with a solid rib below, and having so much refuse in it it could hardly be expected to make such a general havoc as it did. But it is more than likely that it was through a partial sagging of the roof in the center up to or from the solid rock, and the said space filling up with water, and on receiving further pressure, the said water acting as a hydraulic press, the fluid distributing the pressure equally over a large area, and especially so since there was not sufficient room below the said roof for it to fall and break, thereby taking off the fluid from the press, as it were. There was no cave took place, except a slight breaking of the edges along the main or lower east gangway, and a few other parts, it was a general move or crush, as it had no room to break down. Of course it closed the gangways and chambers over acres of ground, by forcing the overlying bone of the coal seam and the sides of pillars into the excavations. In some places not even the bone was broken on the gangways.

We have had a number of caves in this district besides that of Sugar Notch during this year, such as at Pine Ridge, Hutchinson, Mill Creek, and the Empire collieries. I would state that many of those with a proper system of mining could have been avoided. When the roof is known to be liable to give way where the excavations are large in area, or not well and properly timbered, then surely some provision should be made to support said roof either by extra timbering, or by leaving a larger width of pillars in proportion to the width of their working places, or to reduce the width

of the excavations or chambers and pillars as well, that is under similar pressures, and not so with increased pressure. Then, again, where there are two seams in close proximity, there being but eight or ten or fifteen feet of slate, bone, or rock, or, perhaps, a few feet of each in space between them, then great care should be taken to constantly learn from the seam or bed driven in advance the actual thickness and quality of the same. When the approximate thickness and quality of the said intervening ground is known, a particular plan should be adopted by which these seams or beds may be most safely and economically extracted, and not let the whole matter go unnoticed or unattended until the bottom has fallen out of the upper workings, and perchance, the roof as well, which is unavoidable, should much of the partition between the seams give way. The pillar in the one should be kept at some particular angle or direction in relation to those in the other, whatever way is thought best, after having given the matter attention and study. There is nothing to be expected but caves and trouble when the said seams are being driven, some times the upper, other times the lower one in advance, not knowing anything of the thickness of materials between the two seams, and yet it is known there cannot be much from past tests—tunnels, &c., and again from sounds of working and blasting. And again, from driving the chambers without regard to the direction of those in the seam immediately above or below.

The matter of caves, whether from accidental ones or those brought on by robbing and letting down the roof designedly, is going to be a matter deserving, and must have attention in our mining operations in the near future, independent of the danger from caves by the falling materials. In this connection there are three things to be considered: The surface, whether it will be damaged sufficient to injure improvements, if there be any on it, such as houses, &c.; and again, whether there be any danger from inundations from rivers, ponds, or canals; and next, whether the expense from increase of water will not over-balance the benefit gained from robbing the coal. But that which is likely to be the greatest evil is the creation of mammoth reservoirs or receptacles for the accumulation of explosive gas, with its train of evils.

It may be all very well to get out the coal, but the moment one of these cavities become filled with the above dangerous element, just that soon are we liable to have such terrible catastrophes as we read of having occurred in foreign lands occasionally, that shock the civilized world. I now wish to warn our people against the thought of taking out pillars in any mine, unless it be that the said seam be entirely exhausted to the limited distance to be driven, called boundary line, say fifty or sixty feet short of the said line; and further, that there be, at the same time, no other seam being extracted or worked over-lying it, or any one within thirty feet, being worked below it, nor any connections to an adjoining mine in the same seam, not to speak of those that may be ventilated through the same channels as the one proposed to be robbed, which, of course, no good miner would ever

think of doing for fear of the sudden stoppage of ventilation, or the liberation of large quantities of gas. Now then, ruling out these places that their pillars can not be robbed without incurring the risk in either of the cases above mentioned, how many of our mines are to-day in a proper way to rob out the pillars, even should they have finished their workings forward to the line.

Then, again, in order to be able to take out the pillars successfully, with any degree of safety to the workmen, and with a view of economy, the chambers should be driven forward very narrow, and the pillars left quite heavy, to the line, and the robbing began at the back end, in a systematic manner, thereby having a safe retreat, and the coal from the upper seam robbed out first, which would perhaps let down some additional surface-water, but this could not be well avoided.

### Ventilation.

I do not intend to make any attempt at writing anything new on the general subject of ventilation, nor yet on the means employed to produce ventilation. It is my desire, more particularly, to call attention to a few points that to me appear to threaten us with danger—yes, imminent danger.

I would point out the dangers of the present system of connecting two or more mines, and especially to ventilate the one or both mines, or parts of either, through more than the one air-way. Each and every mine should be kept separate and independent, so far as possible. This should be done to protect the mines, first, from water; next, from fear of having the misfortune of a mine fire to contend with, so that should one take place, it may easily be extinguished by flooding with water, or otherwise. Then, again, from the evil effects of an explosion of gas in an adjoining colliery. Three good reasons, in my opinion, why mines should not be connected. But even should it so happen, that the different mines belonging to the same company are already connected for some reason, as there are cases, when at the time being it is a convenience to have a connection, then I say that their ventilation should be kept entirely separate and independent, in every particular. The idea of making one mine an intake for the air which is to ventilate another, is radically wrong in every respect. The air-current, from intake to outlet, should be under the control and supervision of the officers in charge of the working-places which are to be ventilated by the same, as well as the machine that causes said ventilating current to move. In this way the moment anything appears wrong with the air-current, they would at once know where to look for the cause, and would search for it, and apply the remedy. Instead of that, we have some mines depending entirely for their intake and supply of fresh air, from and through another or adjoinging mine, and must depend on the condition of things in the said adjoining mine, without any knowledge or control over them. In fact, I doubt whether they fully know the circuitous route of the said intake, and being under the supervision of others, they make no attempt at knowing.

The ventilator, as a matter of course, may or may not be under their control. It matters not much in such a case as the above, as they cannot do much without an intake under their control.

Then we have other cases, where the ventilator is placed at one mine, but does duty for two mines. That is, a portion of its supply of return air is from two mines, the respective currents being divided by a regulator. In this case, again, one of these two mines has to depend entirely upon the condition of things in the adjoining mine and that of the fan speed, as well as that of the regulator's condition, over which he has not the slightest control, and I say, that any mine so located, is liable at any time to have trouble, that would or could be avoided if that each mine had its separate and entirely independent ventilation. And the ventilator of each mine should be exclusively under the control of the mine foreman, being governed as to its condition relating to maximum speed and repairs by an authorized person, such as a master machinist, &c. Then he could select the proper time to have repairs made, and govern the matter of speed, up to the maximum, to suit the condition of things in the mines. It is not practicable to get the same results from any two fans, when their intake currents or returns are connected, as when they are separated, hence it is of great importance to bear this in mind, as the moment that a change takes place in the conditions with one of the two, its effects are felt in the change of the work performed by the other. Also it is only under very extraordinary conditions that the quantities can be had in anything alike, when that two are receiving their supply of air from the same intake, as if the two had separate intakes.

The following abstract, taken from a very able and interesting paper read by Mr. J. C. Simpson, M. E., (Mr. S. was several years ago a mechanical engineer and foreman under the Delaware and Hudson Coal Company in this valley,) at the June meeting of 1879, of the Institute of Mining Engineers of North of Scotland, may be of some interest to our mine officers, which proves very conclusively the folly of placing more than one fan on the same outlet or current. This corroborates the findings of the writer and others in this district, in actual practice, in several cases. At Audenried and No. 4 slope, Naticoke collieries, the fans had to be supplied by separate airways and territories to enable them to give good results, as well as at some other places.

**Experiments with One and Two Fans on the same Mine.**

| NUMBER OF EXPERIMENTS. | One or two fans. | Revolution of fans. | Cubic feet per minute. | Water gauge in inches. | Horse power in the air. | Indicated horse power of engines. | Power, per cent. utilized. | Cubic feet of air per revolution. |
|---|---|---|---|---|---|---|---|---|
| 1, . . . . . | 1 fan, | 20 | 58,968 | .80 | 7.43 | 13.70 | .54 | 2,948 |
| 6, . . . . . | 2 fans, | 20 | 59,400 | .75 | 7.02 | 23.52 | .29 | 1,485 |
| 2, . . . . . | 1 fan, | 30 | 67,960 | 1.10 | 11.78 | 31.34 | .37 | 2,265 |
| 5, . . . . . | 2 fans, | 30 | 68,190 | 1.05 | 11.28 | 50.83 | .22 | 1,136 |
| 3, . . . . . | 1 fan, | 40 | 92,436 | 1.80 | 26.21 | 68.07 | .38 | 2,410 |
| 4, . . . . . | 2 fans, | 40 | 90,155 | 1.80 | 25.71 | 101.98 | .25 | 1,133 |

Guibal fans, diameter, 36 feet; width, 12 feet; engine cylinders, $29\frac{3}{4}$x30 inches. Temperature at surface, 46 degrees; return air in mine, 64 degress. Depth of shaft, 453 yards. Both fans same size. Shutter open in both fans—12 feet by 4 feet 3 inches.

**Air-Crossings or Bridges and Air-Stoppings.**

Considerable attention has been paid to the matter of large airways and cross-cuts, as also to the matter of a more substantial manner of building stoppings, and we have improved from the old wooden or boards to strong and good stone walls; yet we have by no means reached perfection in this regard. The matter of air-crossing has also been much improved in having larger and stronger ones made, but the best has not been sufficient to answer its purpose, being constructed generally of wood.

I wish now to call attention to the necessity of erecting the stoppings of stone and mortar, and the walls built as a double arch or two segments of circles, back to back, or rather concave to concave, or *vice versa*. Then the space between to be filled up with rubbish. The air-bridge or crossing should also be made of heavy and strong masonary arches, one across the other, or of strong boiler or cast iron segments of circles. Better still could they be made in the solid ground, leaving natural strata between. This is done sometimes in large seams, or when there are two small seams close together. Our wooden bridges are too easy of destruction in case of an explosion and strong concussions, which has been demonstrated in some of our mines lately, and I hope this matter will receive more attention in the near future.

**Doors and Cross-cuts.**

The matter of doors should also receive more attention, by arranging the work so as to require as few doors as possible, and at the same time keep the air circulated to the working faces, and then they should be so placed as to be easily doubled, in such a way as to be able to pass a long trip of cars, and a team through the one door, and have it closed before having any necessity of opening the second. The length of said space will de-

pend much upon the length of the trips used, and the grade between the doors, if there be any, which should be as light as possible.

Then the cross-cuts should be made large, but never driven except when needed, and always made at the proper time and place. In fact, by a regular rule, to be deviated from only in case of actual necessity. They should be driven in chamber pillars, in line in the first, and third, and fifth pillar, &c., and those in the second pillar in line with the fourth, and sixth, &c., and the one in the second to be opposite the center of block, between the cross-cut in opposite pillars first and third. Two thirds our present cross-cuts, if properly located and arranged, would give us better results than we have now in many mines. Employers should insist that this be done by their bosses, for economy and general benefit.

### Inquests.

The matter of holding inquests under the mining law of 1870, seems to be in a very mixed state in this district. Ever since the court decided in the West Pittson case, that on account of the existence of some law passed in 1856, intended to correct abuses under which the citizens of the county of Luzerne then labored, it is difficult to get any inquest held, unless it be a voluntary act of some justice of the peace, who may not happen to know of the decisions of the courts refusing payment to coronor or jurors. Sometimes, because of the said 1856 law, and again because the coroner only is authorized to act. Then again, in some cases parties interested, get a person who may hold the office of justice of the peace, to hold one for their satisfaction, and being entirely unacquainted with the duties, in nine cases out of ten it is very liable to be a mere farce, either by placing improper persons on the said jury in his ignorance, or otherwise by carrying the investigation in a careless manner, or by turning it into an attack upon some particular person or persons, officer or officers, more than to seek the real cause of the disaster impartially, or perhaps by screening some parties, persons, or officers.

The State officer, the inspector, has no power in the premises; he is required to attend such, it is true, if notified, but that is all, except to hold examinations. This often is not satisfactory to himself or others. Many have an idea that the inspector is the one that orders the inquest, or neglects ordering of the same, at his own pleasure. This is all a mistake, as an inspector has nothing to do with it, except to attend and be there, subject to the action of the coroner and jury, who may invite him to ask some questions of the different witnesses, or they may refuse to allow him so to do, as the foreman did at the West Pittston inquest, in 1871. Then, again, some people blame the inspector for the composition of the jury. This, again, is an error, as he has nothing whatever to say in the matter, and seldom, if ever, is consulted about its composition.

It is the conviction of the writer, after some nine years' experience in the business, that there should be an amendment passed to our inquest law, to enable the proper officers to hold inquests, under the mining law of

1870, and to be paid for the same as in other counties. Then, again, it should be so arranged that deputies should act in a certain district, to be described so that there may be several of them, as it is simply impossible for any one person to act for the whole of the Lehigh region, Lackawanna, and Wyoming valleys. These persons would soon become fully acquainted with their duties; and the inspector should be authorized to interrogate all witnesses he saw fit. This would be great satisfaction and relief to an inspector.

#### Explosions of Carbureted Hydrogen Gas.

There has been a large number of explosions of carbureted hydrogen gas in this district this year, yet there was but one case where that anything like a large quantity was exploded, except that in the Mill Creek colliery, whereby five lives were lost, and that explosion which happened in the Empire colliery, where several persons were slightly injured by the same, but their escape seemed almost incredible, when the damage to the mine, in forcing down stoppings, doors, timber, &c., was so great, and this all in the middle of a section that had been honey-combed, and nothing left but the pillars and one bench of top coal.

This explosion puzzled people to know how it could have occurred in the location it did, there being room for the gas to ascend to a higher elevation without any restrictions, and being examined besides by the officers, occasionally, yet it must be that the gas had been stored in the cavity formed from the sagging of the top coal over the chamber, when a space of some few inches in thickness would be occupied by it, covering a large area, some hundreds of cubic feet, reaching perhaps to over one hundred cubic yards, only that it was distributed over a large area, and not confined to a small space when ignited. This was probably kept in the said cavity until it had quite a tension, and being in an undiluted state and compressed, when released from its confinement, into the presence of atmospheric air, it at once became expanded, first from change of pressure or tension released, and next from the law of diffusion of gases, whereby it increased in volume and became at once explosive. It was probably released from the artificial reservoir, or space between the top coal and the roof, through a slip, break, or fissure, there being a move at the time in the said top coal, and some spalling of parts of the pillars, brought on by pressure from the top coal, which had not been mined. As I said before, it is surprising that no lives were lost in this case, much more so than had there been half a dozen or more, which can only be attributed to what some call good luck. Much the same as it turned out in a case in the Hillman seam in the same colliery, a few years ago, where a large quantity of gas was left to accumulate, and ignited by workmen in traveling through the same to or from the surface, causing a terrible explosion, yet, more by good luck than good management, no serious injury to persons were received, but the wreck to property told the tale of the power that had been at work. And I now point out, that unless more care and better judgment prevails, with the

greatly increased dangers from their old caves, some brought on designedly and others not so, there may happen cases there ere long that their good luck may happen to be absent—hope not, yet better a preventive than a cure, and now is the time to point out the threatening danger. I say, unhesitatingly, that those caves must become reservoirs of the miners' foe—carbureted hydrogen gas—and, sooner or later, catastrophes must result from them, unless they be properly ventilated, and how can they be so ventilated?

We have had no such thing as a general explosion of gas in a single mine or case in this district since I have been in office. Each and every case that has occurred may properly be called a local explosion. Some of these might, and should, have been avoided, and unless that we in mining should, in future, reach such perfection, different to anything known in other branches of business, and that our people become so constituted as to avoid all human errors, surely these, or similar misfortunes, or happenings, will be visited upon us occasionally. The same as in railroading, or any other dangerous calling. It is true, they frequently can be accounted for, after they occur, by the most careless and ignorant, who will say, wisely, had it not been for such and such a thing, or person, that case might have been avoided. I say that any mine is liable to have these local explosions, no matter how perfect their ventilation may be, because there are, and always will be, circumstances whereby there will occasionally be considerable quantities of explosive gas in different parts of each gassy mine. Now, then, if by the carelessness, or oversight, of some one or more, the said gas be ignited, the whole mine should not be condemned. Nearly each severe case we have had in this district, has been when repairing, making improvements, or when the mine was not producing coal, and mostly by the very persons whose duty it was to prevent others from going into said danger. Such as Henry, West Pittston, Mill Creek, Prospect, &c., &c. As I said before, this may take place in any well-regulated and well-ventilated mine. To say that it is possible to prevent, absolutely, these local explosions in each and every working mine, is the height of absurdity. With as much propriety, could it be said that, with proper police regulation, a city may be kept free from cases of homicide and suicide. The police force and regulations no doubt prevent much disorder, plunder, and other crimes, in protecting life and property of the law-abiding and order-loving citizens from the roughs and disorderly elements in society. And the same may be said of mining. While there is no such thing as absolute freedom from mine accidents, as they are named, but often wrongly named, yet the mine ventilation law, and other rules in and about the mines, with their enforcement by the officers, certainly must be a great protection to everybody. The ignorant, against whom so much is charged, is protected against himself, as it were, and the carelessly inclined is frequently warned and cautioned, in various ways, of his folly, and the whole resulting in a general benefit, as well to protect the life of the most competent and careful from the recklessness, carelessness, and ignorance of that class, as well as the property of the employer.

We know but little in this country about the worst kind of danger from gas explosions—caused from the sudden liberation of large quantities of explosive gas, whereby a whole side or section of a mine is flooded. This takes place where the mines are very deep, and the gas pent up, under heavy pressure. Such cases are of frequent occurrence in Europe. A safety lamp, in such cases, is the only hope of the miner, and that only under favorable conditions. We are very free from this danger, and working mines on longwall system, another evil.

### Mine Improvements.

For several years past, mining improvements already commenced have been suspended, and those in contemplation postponed, but the great and sudden change that took place in the coal business during 1879, with its unprecedented increase in the production of coal, caused a stir in the matter of mine improvements, as it is well known that with having done so little dead work since 1873, and with the prospects ahead of mining from twenty-three to twenty-five millions of tons of anthracite coal for 1880, and an increase afterwards yearly during the period of time required to produce, as it certainly will be, another general business stagnation, if not a panic, then I say our coal men see at a glance that the sooner they get to work on improvements, the sooner they will be able to take part in the increase above mentioned. Knowing that it is necessary to do so, in order to keep their capacities even up to an ordinary production, much less the apparent increase. Hence, I say, the work of sinking shafts, erecting breakers and new machinery of various kinds, has been resumed.

Salem Coal Company, Shickshinny, has driven a new, tunnel to reach a basin or trough of coal dipping westward, and disconnected from their former workings by a rock fault, and which is claimed will enable them to mine considerable coal in time to come.

SUSQUEHANNA COAL COMPANY.—The most important of the improvements made by the above company that I know of, is the erection of two new fans, and a new breaker under way. A fan, twenty feet in diameter, was placed adjacent to the one previously located near No. 2 slope, to assist in the ventilation of No. 4 and No. 2 slope workings, and the old mines. This fan, at first, did not operate satisfactorily, but after that they separated the air passages, so that each could work independent, then it gave more satisfactory results. The other fan was located near the same place, and was of the same dimensions, but it is to ventilate the upper seam operated in the No. 1 shaft, which was formerly ventilated by the fan located at the shaft head, but which may now be used exclusively for the lower seam, where they are driving out for a second opening, and confining themselves to the number of "not exceeding twenty persons" employed there at one and the same time, as per last decision of his honor, Judge Harding. A new fan is soon to be placed near No. 1 slope, twenty-five feet in diameter, to ventilate No. 2 shaft mine.

Gaylord Coal Company.—This company has begun the sinking of the new shaft located near the slope, and which had been commenced by the Lehigh and Wilkes-Barre Coal Company several years ago, and operations suspended during the panic. The said new shaft is to be continued to the red ash seam, which will be reached about the same vertical depth as that of the Nottingham shaft, where the same seam is being worked, and it is probable that the second opening, required by law, may be secured by driving to and connecting with the said Nottingham workings, which have already been driven a long distance eastward from the Nottingham shaft. The same company is erecting a large and convenient coal breaker at the said colliery, on the site of the old one which was destroyed by fire. The new breaker is intended to clean and prepare the coal from the slope and the shaft, and will be a great assistance to the already large and thriving business of the town of Plymouth.

Kingston Coal Company.—The most interesting part of their improvements, has been the sinking of a new shaft, located near No. 2 shaft, which is to penetrate the red ash seam, and is to be used as hoisting and ventilating shaft. This shaft is down at present below the Baltimore seam. both splits, and from present indications will be completed early next year, A large fan, twenty-five feet in diameter, has been partially erected at the head of said new shaft. The writer endeavored to have the superintendent, Mr. Daniel Edwards, to erect a larger fan—not less than thirty feet diameter—but for reasons best known to himself, decided upon the size above mentioned, which no doubt will answer all purposes for a few years at least, unless a very large quantity of explosive gas should be met with there. The same company contemplates the sinking of another shaft soon, near the No. 1 shaft, also to the red ash, when a connection will be made between the same and the one at No. 2 shaft.

Waddell, or Raubville Colliery.—What was formerly known as the Ellenwold colliery, has been divided into two parts, and is being operated by two separate parties. The western part, better known as the drifts, has been leased by Messrs. Waddell & Walters. At the said drifts a small breaker has been erected to prepare the coals from the same. There being four of them, two on the red ash and two on the Ross seams.

The new company commenced to ship coal in June, and shipped about thirty thousand tons.

I did expect to have been able to report the erection of one or two fans at this colliery, as the officers and operators had promised to do so faithfully; but I am sorry to say, that they did not live up to their promise, although the condition of the workings required it, and only through the tolerance of their workmen, could they expect to work, together with the promise of improvements to the inspector, which he, like the workmen, depended upon, to be once more disappointed. It would appear that fair promises, to be disregarded at these drifts, are contagious. I hope we may soon have a change, and that by the time another report is due a better state of

things will exist, and that a proper system and ample ventilation will, for once, be had, to enable the inspector to so report, and the employés to have what they are entitled under the law—good ventilation.

ALBRIGHT, DICKSON & CO.—This company operate, or rather are taking and exploring the territory in the same seam that the Ellenwold Coal Company operated in their new shaft. They began to drive a trial slope on the dip of the seam, in a southerly direction, and are down now over one thousand feet, having reached a vertical depth of about two hundred and thirty feet, and are still driving ahead. They are also driving the work necessary to secure a lawful second opening to the same, and doing other work, preparing for fan erections, &c., looking to the general operating of the colliery during the year 1880, to all appearance. Time alone will tell what the result may be. It is fair to say, however, that if pluck and perseverance, and a desire to comply with the law amounts to anything, then they should succeed, which success they are fairly entitled to.

RED ASH COAL COMPANY.—The said company has built the coal breaker which I mentioned in my last report as being in contemplation, and although it is only considered a small concern, yet their shipments from July to December of this year, both inclusive, amount to nearly twenty-five thousand tons of the celebrated red ash seam, and the colliery has the appearance of being a safe one for the workmen, and a paying one to the operator. The company has promised to erect a fan fifteen feet in diameter in the spring of 1880, to ventilate the workings and to take the place of a furnace temporarily erected there until the said time.

H. B. HILLMAN.—Mr. Hillman has sunk a new slope on a seam overlying the Hillman seam to the south, and has commenced shipping coal therefrom. Having already moved his fan to said opening, and had a second opening, &c., as required by law, Mr. Hillman is one of the very few individual operators now operating in this district, and it would appear that while he does not seem to be desirous to go (deep) into the mining business, he still likes to prove to our mining people that he can secure considerable of the black diamonds without going very far away from where he and his friends have been mining and preparing coal for market for the last thirty years. And so far as the writer knows, during his time as an officer here, the men employed by Mr. H. have done as well as under any other employer, and have been very free from accidents, unusually so. This, I say, is to the credit of both officers and the workmen, because neglect on the part of either would have been sufficient to produce different results.

DELAWARE AND HUDSON COAL COMPANY.—The improvements done by the said company consist principally in the erection of a new fan twenty feet diameter, near the old Swetand or No. 4 colliery, Plymouth, to ventilate the workings in No. 5 colliery, which was formerly done by a fan located at the head of their hoisting shaft. Mention was made of the unsatisfactory condition of this mine, and some others, in my last report; and now that the new fan above mentioned had been put into operation, I

am in hopes that the condition of this mine will soon be fully satisfactory from what improvements have been done and are now in progress. I should have said in addition to the erection of the said fan, that a mine locomotive engine was placed on the track inside to run between the shaft foot and the head of their new slope, a distance of over three thousand feet. Also, that the tunnel started several years ago in the No. 1 Baltimore colliery, from the Baltimore seam to the red ash seam, has been started again after having been lying idle for some time. This tunnel will open up a very large field of the red ash seam, which, if it proves good, will be very convenient to the said colliery, as they are fast working out the big vein in the old front and back slopes.

Lehigh Valley Coal Company.—The principal improvement made by this company in this district has been the erection of another large fan, thirty feet diameter, at the Prospect colliery, which is intended to take the place of the first one built there. The old one will still be kept in its former position, and retained for an emergency, to be used, should occasion require, in case of breakage or repairs to the new one. This is almost as good as the principle of the duplicate system adopted in machinery, and is certainly worthy of commendation wherever it may be done in the ventilation matter. We have only one or two others such in the district, Wyoming being one. The old fan was twenty feet diameter, and was also located at the head of the shaft, and built on about the same principle as the new one, except in the matter of the space, which is usually left between the tips of the vanes and the end of the casing, and which increases in depth from a given point, say about five eighths of the circumference, that is to say that the expansion takes place for about three eights of the circumference. But in this last built fan at Prospect, the said space has been increased from a point—the distance between any two of the said vanes—from the point of cut off, or discharge, into the chimney or outlet, making the said increasing space continuous for about seven eighths the circumference, in a scroll-like form, thereby having a continuously and uninterrupted channel filled with dense air from the periphery of fan or tips of the vanes. This fan, when running forty revolutions, moves about one hundred and forty-six thousand cubic feet per minute, having a water gauge of 1.25 inches at shaft head. Depth of shaft, six hundred feet.

This company has started up the Midvale and Mineral Spring collieries during the year.

Lehigh and Wilkes-Barre Coal Company.—The mines of the above named company, have been operated for the last several years by Messrs. Charles Parrish & Co. During the year 1879, a great deal of improvements have been made.

*Hollenback Colliery.*—As mentioned in my report of 1878, the second opening shaft was finished, and a fan of the Guibal pattern erected on the same. Since that time, a connection was made to said air-shaft from the Diamond colliery, and the fan put in motion to help ventilate the same. In

the meantime, the second opening from the main Hollenback shaft was being driven to connect the aforementioned air-shaft. The matter of driving to the dip from the air-shaft was abandoned on account of the very strong gas feeders met there within a few yards of the shaft, as well as for the safety and reliability of ventilation for the Diamond colliery. In due time, the said connection was made to the said air-shaft, and by that time another large fan of the same pattern, was erected at the head of the same shaft, being thirty-five feet diameter, and being the largest fan built in the district, and so far as I am aware, in the United States. Yet it is only small, comparing it with those erected of later years in England, some being forty-five, and one fifty feet in diameter. Yet we are inclined to look at our fans as monstrously large.

In addition to the aforesaid improvements, and the long distance of about fourteen hundred feet driven for a second opening, a very fine coal breaker has been erected at the shaft head. It is claimed that this structure has many valuable changes in its arrangements and construction, that must be great improvements in the cleaning and preparation of coal, besides great economy in not destroying so much coal in accomplishing the same, which should be appreciated as much, if not more, by the land-owner as any one. The capacity of the breaker is also to be very large, and will be ready to put into operation within a very short time.

*Audenried Colliery.*—A new coal breaker is now being built, to re-place the one burnt down at this mine last spring, but it will not be ready for some time to come, neither will it be needed soon, as the mine will not be prepared to produce coal for many months, if at all, during the next year.

A new air shaft is being sunk for this mine, located northwest from the main shaft, at a point near the corner of Stanton and Hazle streets. This shaft will be about six hundred feet in depth, more or less, and is expected to penetrate the seam near the first anticlinal axis, north of the one through which the Looney tunnel was driven. This being new territory, and having no convenient out-crop or other outlet, it is to be expected that large quantities of carbureted hydrogen gas will be encountered there, and very likely strong feeders cut in the sinking of the said air shaft. A large fan, thirty-five or forty feet diameter, is to be placed on this shaft. The Audenried colliery shaft was sunk on top, and right down into an anticlinal, being a very small but abrupt one, almost forming into a fold, which it did a short distance further east. The measures have been subjected to great disturbances hereabouts, being uptilted in almost every direction, and assuming nearly all degrees of pitch from zero to ninety degrees.

In a large seam of such pure coal as the Baltimore is usually found, with its great slips and other cleavages, with scarcely any bands of slate or bone, or other impurities running through, it is difficult to keep gangways, cross-cuts, or other air-passages open. Add to this the fact, that seldom do our new mines receive the attention they should in opening the same, being almost a common error. Then when it is too late, it is found neces-

sary to make provisions to meet the forces, and difficulties here pointed out, and in addition thereto a demand for extraordinary ventilation, to meet the large amounts of gas generated and encountered. We have mines in this district generating a much larger amount of explosive gas per minute than this mine, but they are not as difficult of handling, on account of the irregular lay of the seam and its thickness. Then it is just as true, that the management has been very unsuccessful here. Mr. Weir, was the fourth mine boss, and Mr. William T. Smyth, second general mine foreman, under whose administration the terrible calamity, from which eight persons were horribly burned, and from which six died, and in consequence of which the mine was flooded, and subsequently the breaker burned. Mr. Weir has also been superceded by Mr. M. R. Morgans.

Hartford Colliery.—Great improvements have been made at this colliery during the year just past. A new slope has been sunk from the surface in a north-westerly course, and reaching down to the bottom lift, being No. 3 slope, south-west side, and is being driven downward from there towards the center of the basin lying between the south-west and north-west gangways in the said No. 3 slope, on the Baltimore seam. A pair of first motion engines, from No. 3, Hollenback slope, have been placed at the head of the said slope. Two tunnels have been commenced there also: one from the Ross to the Red Ash seams, in No. 2 slope, and the other from No. 3 slope, Baltimore, to the Ross seam. A new fan, twenty-five feet diameter, of the Guibal pattern, has deen erected near the head of the aforesaid new slope, which will be very convenient and timely, as the old ones are too far away, besides being too small to properly ventilate the said extensive workings.

Wanamie Colliery, No. 19.—A new tunnel has been driven here, from near the slope foot southward, to cut the Ross and Red Ash seams, besides opening of two drifts higher up on the mountain on the Ross seams. Another tunnel has been started near the No. 18 breaker, to prove a territory formerly left for some reason untouched, yet being quite convenient to the said colliery.

I should have said also that a new slope is being sunk to the north-west in the No. 2 slope, or No. 19 colliery.

Empire Colliery.—A new fan, twenty feet diameter, has been erected at this colliery, on the Hillman workings, to substitute the one on the south side of the basin, which was only fifteen feet diameter, but which had done valuable services, having been run to one hundred and thirty revolutions per minute at one time. A little of the history of the ventilation of the Hillman seam, from 1872 up to the close of this year, probably, would not be out of place here. In April of 1872, I notified the officers of the company, being then Messrs. G. H. Parrish and John T. Griffith, to suspend all further mining in the Hillman seam, until properly ventilated. They complied in stopping, but the first day after it was done, or the same evening, a committee of five miners waited on me to beg of me to let the mine

work on while the improvements were being done, and pleaded very hard for a compliance, as they put it for their sake, &c. I did not see the propriety of so doing, replying that the company's officers had been given ample time before to improve the same, and that, should I do so, it would establish a bad example for other mines to do the same, by sending committees to beg off, &c. This committee was composed of five persons, at the head of which was Mr. John T. Walters. Subsequently Mr. Parrish informed me that he was going to put up a fan, ten feet diameter, that would answer all purposes for said workings. I remonstrated as to the size. He said that he would guarantee that the little fan would cause to circulate at least thirty thousand cubic feet of air per minute. Then I had to consent to their trying it, as I had no power to dictate size, &c., as I had no right to do any more than call their attention to what appeared to me an absurdity; and I did, and further informed them that it would be money thrown away, as I would be compelled to ask them to stop again very soon, unless the said fan would give results much beyond my expectation.

In May the fan was started. Shortly afterwards I visited the mine again, and by this time my predictions of the utter inability of the little ventilator to give the result claimed, was only too well known to the mine officers, Messrs. Parrish, Griffith, and Jones. The consequence was, they had soon again to stop, and put in another ventilator, fifteen feet in diameter, which did very good work. In the month of June, of this year, I found the ventilation again entirely inadequate to remove the powder-smoke in the said workings, and I once more made a request on Messrs. G. H. and F. B. Parrish for one of two things, to either suspend one half the men there at work—*i. e.*, to stop one half the number of workmen in the said seam, or else put in double the amount of ventilation they then had. They at once replied that they would put up a new fan of larger dimensions, &c., which they did in very short time, and proved quite satisfactory, thus making a third fan put on said seam-workings, and each of different dimensions, being successively larger, and all within a few years.

A new tunnel is being driven from the Big, or Baltimore seam, south, from the level of the shaft gangway, to cut the Ross and Red ash seams, should the former prove in the said tunnel. This tunnel, which will be from ten to eleven hundred feet in length, will open an area of the red ash seam from the said level up to the crop, and extending east to their boundary line, and west the same. It is intended to drive a connection from the said tunnel, up the pitch of the seam to No. 2 shaft. This shaft and its workings were stopped by the writer in August, 1870, except the number of persons then allowed to work for a second opening. The company's officers, for some reason, determined not to make a second opening at that time, and no work has been done there ever since. It is now supposed work will be resumed there within a year or two, as they have already taken out the water. There is another tunnel being driven in this mine, from the Hillman to the next overlying seam, called the kidney seam.

DIAMOND COLLIERY.—A tunnel was driven in this colliery to facilitate ventilation, of about three hundred feet in length. A new slope is also being sunk there. They require a separate and independent intake air-way for this mine, which they must have soon, or they will have trouble.

HUTCHISON COLLIERY.—A new fan, sixteen feet in diameter, was placed at the head of this colliery, to take the place of the other fan, which was only twelve feet in diameter, and, as a matter of course, some improvement obtained by the change, but a great deal more could be had, if the shaft part of the air-way would be properly looked after. It is very wet, and herein lies part of the difficulty. Why it is not attended to is very strange, as I have seen more than one half the air-current caused to circulate by the fan, passing directly into the fan, without having reached the foot of said shaft. There is one particular improvement connected with the new fan, besides its additional capacity, and that is this, that it is driven by a separate engine, whereas the old one was driven by the breaker engine, a thing that never should be done by any concern of the size of the Hutchison colliery. The management of this mine has always been of a very unsatisfactory kind, in so far as the general condition of the same has been. It is true, that the times have been severe on the operator for many years, and he has had many hardships to contend against, yet it appeared to the writer, that better management would not have added any thing to his troubles, but might have been the means of avoiding some of them.

TABLE No. 7 —*Shows number and dimensions of fans in use in 1870 in this district.*

| Number of fan. | Location of Fan. | Fan dimensions, revolutions, and water gauge. | | | | | | Engines. | | | Discharge in cubic feet per minute. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diameter—feet. | Width—feet. | Number of side inlets. | Diameter—feet. | Revolutions per minute. | Water gauge—inches. | Number of. | Vertical or horizontal. | How connected | |
| 1 | No. 2 colliery, W. C. & L. Co. | 10 | 3.3 | 2 | 5 | | | 1 | Horizontal | Belt. | |
| 2 | No. 1 colliery, D. and H., | 12 | 3 | 2 | 6 | . . . | . . . | 1 | " | " | |
| 3 | No. 9, Sugar Notch, . . | 10 | 3.3 | 2 | 5 | . . . | . . . | . . | " | " | |
| 4 | Pine Ridge, . . . . . | 20 | 6.66 | 1 | 10 | 85 | . . . | 1 | " | Direct, . . | 49,500 |
| 5 | No. 4, Empire slope, . . . | 10 | 4. | 2 | 5 | 85 | . . . | 1 | " | " . . | 36,000 |
| 6 | Henry colliery, . . . . . | 10 | 3.3 | 2 | 5 | . . . | . . . | . . | . . . . | Belt, . . . | 27,000 |
| 7 | Waterman & Beaver shaft, | 10 | . . . | 2 | 4 | . . . | . . . | . . | Horizontal | " . . . | 15,000 |
| 8 | Fullers' shaft, Plymouth, | 8 | . . . | 2 | 3 | | | | | | |
| 9 | Lance colliery, . . . . . | 8 | . . . | 2 | 3 | | | | | | |
| 10 | Washington colliery, . . . | 5 | * | 2 | | | | | | | |
| 11 | Nottingham colliery, . . . | 10 | 3.3 | 2 | 5 | | | | | | |
| 12 | Laurel Run colliery, . . . | 5 | * | 2 | | | | | | | |
| 13 | Mill Creek colliery, . . . . | 10<br>10 | 2.5<br>2.5 | 2<br>2 | 5 | 160 | .8 | 1 | Horizontal | Belt, . . . | 116,000 |
| 14 | Hutchison colliery, . . . . | 10 | 3.3 | 2 | 5 | . . . | . . . | . . | . . . . . | " | |
| 15 | Avondale colliery, . . . . | 12 | 4 | 2 | 6 | 104 | . . | 1 | Horizontal | " . . . | 51,250 |
| 16 | West Pittston colliery, . . | 10 | 3.3 | 2 | 5 | 65 | . . . | 1 | . . . . . | . . . . . | 9,000 |

* Iron cased.

**TABLE No. 8.**—*Exhibits number of fans erected in the Wilkes-Barre inspection district from July, 1870, to December, 1879, both inclusive.*

| Number of fan. | Location of Fan. | Fan dimensions, revolutions, and water gauge. | | | | | | Engines. | | | Discharge in cubic feet per minute. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diameter—feet. | Width—feet. | Number of side inlets. | Diameter—feet. | Revolutions per minute. | Water gauge—inches. | Number of. | Vertical or horizontal. | How connected. | |
| | *Erected in 1870 and 1871:* | | | | | | | | | | |
| 1 | Hartford colliery, . . . . | 15 | 5 | 2 | 7 | 60 | . . . | 1 | Vertical, . | Direct, . . | 30,000 |
| 2 | Franklin colliery, . . . . | 12 | 4 | 2 | 6 | 80 | . . . | 1 | " | " . . | 30,000 |
| 3 | Warrior Run colliery, . . | 15 | 5 | 2 | 7.5 | 80 | .1 | 1 | " | " . . | 41,000 |
| 4 | Laurel Run colliery, . . . | 20 | 6.5 | 2 | 10 | 78 | 1.5 | 1 | Horizontal | " . . | 87,000 |
| 5 | Nanticoke, No. 1, slope, . | 15 | 5 | 2 | 7.5 | 110 | 1.5 | 1 | " | " . . | 57,000 |
| 6 | Landmesser slope, . . . . | 15 | 5 | 2 | 7.5 | . . . | . . | 1 | Vertical, . | " . . | 20,000 |
| 7 | Sugar Notch shaft, . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 28,000 |
| 8 | Maffet slope, . . . . . | 12 | 4 | 2 | 6 | . . . | . . . | 1 | " | " . . | 30,000 |
| 9 | Hollenback, No. 2, slope, | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 30,000 |
| 10 | Hollenback, No. 3, slope, | 15 | 5 | 2 | 7.5 | 85 | . . . | 1 | " | " . . | 39,000 |
| 11 | Port Bowlkley slope, . . . | 15 | 5 | 2 | 7 | . . . | . . . | 1 | " | " . | 32,000 |
| 12 | Hillman slope, . . . . . | 12 | 4 | 2 | 6 | . . . | . . . | 1 | " | " . . | 18,000 |
| 13 | West Pittston colliery, . | 21 | 7 | 2 | 10.5 | . . . | . . . | 1 | Horizontal | " . . | 30,000 |
| 14 | Enterprise colliery, . | 15 | 5 | 2 | 7 | 100 | . . . | 1 | Vertical, . | " . . | 23,400 |
| 15 | Nanticoke, No. 2, colliery, | 15 | 5 | 2 | 7.5 | 85 | . . . | 1 | " | " . . | 68,000 |
| 16 | Dodson, colliery, . | 15 | 5 | 2 | 7 | . . . | . . . | 1 | " | " . . | 44,000 |
| 17 | D.& H.C.Co.'s, No.2, col'y | 13 | . . . | 2 | 4.5 | . . . | . . . | 1 | Horizontal | Belt, . . . | 30,000 |
| 18 | D.& H.C.Co.'s, No.5, col'y | 13 | . . . | 2 | 4.5 | 104 | . . . | 1 | " | " . . . | 33,000 |
| | *Erected during 1872:* | | | | | | | | | | |
| 19 | Nottingham colliery, . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | Vertical, . | Direct, . . | 20,000 |
| 20 | Gaylord colliery, . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 38,000 |
| 21 | Waterman & Beaver col'y, | 12 | 4 | 2 | 6 | . . . | . . . | 1 | Horizontal | Belt, . . . | 63,000 |
| 22 | Hutchison colliery. . . . | 15 | 5 | 2 | 7 | . . . | . . . | *1 | . . . . . | " . . | 20,000 |
| 23 | Conyngham colliery, . . . | 20 | 6.5 | 1 | 10 | . . . | . . . | 1 | Horizontal | Direct. | |
| 24 | Empire shaft colliery, . . | 10 | 3.3 | 2 | 5 | . . | . . . | 1 | | | |
| 25 | Wanamie, No. 2, . . . | 15 | 5 | 2 | 7.5 | 78 | .7 | 1 | Vertical, . | " . . | 49,000 |
| 26 | Wanamie, No. 3, slope, . | 15 | 5 | 2 | 7.5 | 68 | . . . | 1 | " | " . . | 41,000 |
| 27 | Henry colliery, . . . . . | 18 | 6 | 1 | 9 | 60 | . . | 1 | " | " . . | 60,000 |
| 28 | Prospect colliery, . . . . | 20 | 6.5 | 1 | 10 | 70 | 1.3 | 1 | " | " . . | 63,000 |
| 29 | Lance colliery, . . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 42,000 |
| 30 | Empire colliery, . . . . | 15 | 5 | 2 | 7.5 | 100 | 1.6 | 1 | " | " . . | 54,000 |
| | *Erected during 1873:* | | | | | | | | | | |
| 31 | Mill Creek colliery, . . . | 20 | 6.5 | 2 | 10 | 89 | . . . | 1 | Horizontal | Direct, . . | 75,000 |
| 32 | Jersey colliery, . . . . | 12 | 4 | 2 | 6 | . . . | . . . | 1 | . . . | Belt, . . . | 25,000 |
| 33 | Diamond colliery, . . . . | 15 | 5 | 2 | 7.5 | 78 | . . . | 1 | Vertical, . | Direct, . . | 40,250 |
| 34 | Sugar Notch colliery, . . | 15 | 5 | 2 | 7.5 | 90 | . . . | 1 | " | " . . | 44,000 |
| 35 | Harvey slope, . . . . . | 17 | 5.5 | 2 | 8 | 78 | .75 | 1 | " | " . . | 55,000 |
| 36 | Washington slope, . . . . | 24 | 8 | 2 | 12 | 54 | . . | 2 | " | " . . | 44,000 |
| 37 | Grand tunnel, . . . . . | 15 | 5 | 2 | 7 | . . . | . . . | 1 | " | " . . | 20,000 |
| 38 | Franklin tunnel, . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 25,000 |
| 39 | N. J. Coal Co.'s, No. 2, . | 12 | 4 | 2 | 6 | . . . | . . . | 1 | Horizontal | Belt, . . . | 15,000 |
| 40 | Enterprise colliery, . . . . | 15<br>15 | 5<br>5 | 2<br>2 | 7.5<br>7.5 | 100 | . . . | 2 | " | " . . . | 39,000 |
| | *Erected during 1874:* | | | | | | | | | | |
| 41 | Mineral Spring colliery, . | 18 | 6 | 2 | 9 | 60 | . . . | 1 | Vertical, . | Direct, . . | 65,000 |
| 42 | East Boston colliery, . . . | 15 | 5 | 2 | 7.5 | 83 | . . | 1 | Horizontal | Wire rope, | 74,000 |
| 43 | Nanticoke, No. 1, tunnel, | 24 | 8 | 2 | 12 | 70 | 1.4 | 2 | Vertical, . | Direct, . . | 108,000 |
| 44 | Sugar Notch, No. 10, slope, | 15 | 5 | 2 | 7.5 | 80 | .8 | 1 | " | " . . | 25,000 |
| 45 | Espy colliery, . . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " . . | 25,000 |
| 46 | Wyoming colliery, . . . . | 15<br>15 | 5<br>5 | 2<br>2 | 7.5<br>7.5 | 80 | . . | . . | . . . . . | . . . . . | 61,000 |
| 47 | Exeter colliery, . . . . . | 20 | 6.5 | 1 | 10 | . . . | . . . | 1 | Vertical, . | Direct, . . | 60,000 |
| 48 | Hartford colliery, . . . . | 15 | 5 | 2 | 7.5 | 50 | . . . | 1 | " | " . | 35,000 |
| 49 | No.3 shaft, D.and H.C.Co. | 17 | 5 | 2 | 8 | . . | . . . | 1 | " | " | |
| 50 | Wanamie, No. 1, slope, . | 15 | 5 | 2 | 7.5 | 45 | . . . | 1 | " | " . . | 22,000 |
| 51 | Old Baltimore mines, . . . | 17 | 5 | 2 | 8 | . . . | . . . | 1 | " | " | |
| 52 | Empire, No. 5, slope, . . | 15 | 5 | 2 | 7.5 | 100 | . . . | 1 | " | " . . | 36,000 |
| | *Erected during 1875:* | | | | | | | | | | |
| 53 | Warrior Run colliery, . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | Vertical, . | Direct, . . | 30,000 |
| 54 | Baltimore, No. 3, slope, . | 17 | 5 | 2 | 8 | . . | . . . | 1 | " | " . . | 34,000 |
| 55 | Baltimore, No. 1, slope, . | 17 | 5 | 2 | 8 | 60 | . . . | 1 | " | " . . | 40,000 |
| 56 | Salem colliery, . . . . . | 15 | 5 | 2 | 7.5 | 80 | . . . | 1 | " | " . . | 48,000 |
| 57 | No. 1 shaft, Nanticoke, . | 15 | 5 | 2 | 7.5 | 50 | 1 | 1 | " | " . . | 39,200 |
| 58 | Oakwood sh't, Prosp't col. | 30 | 10 | 1 | . . . | . . . | . . . | 1 | Horizontal | " | |
| 59 | Forty Fort colliery, . . . | 15 | 5 | 2 | 7.5 | 50 | . . . | 1 | Vertical, . | " . . | 30,000 |

J. R. HOWELLS.
Mining-Drill.

Fig. 1.

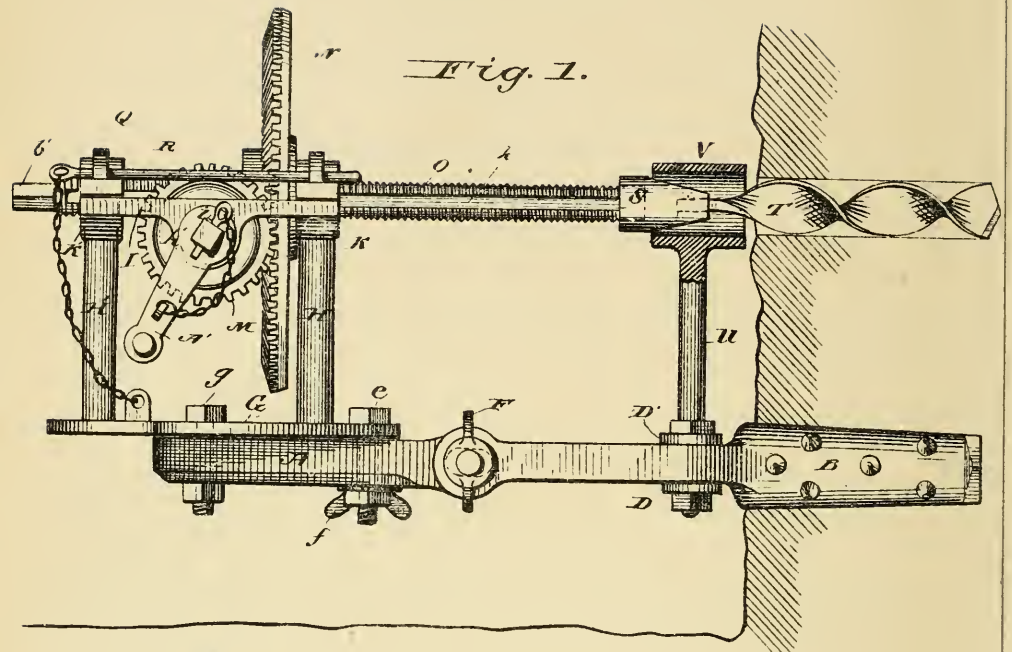
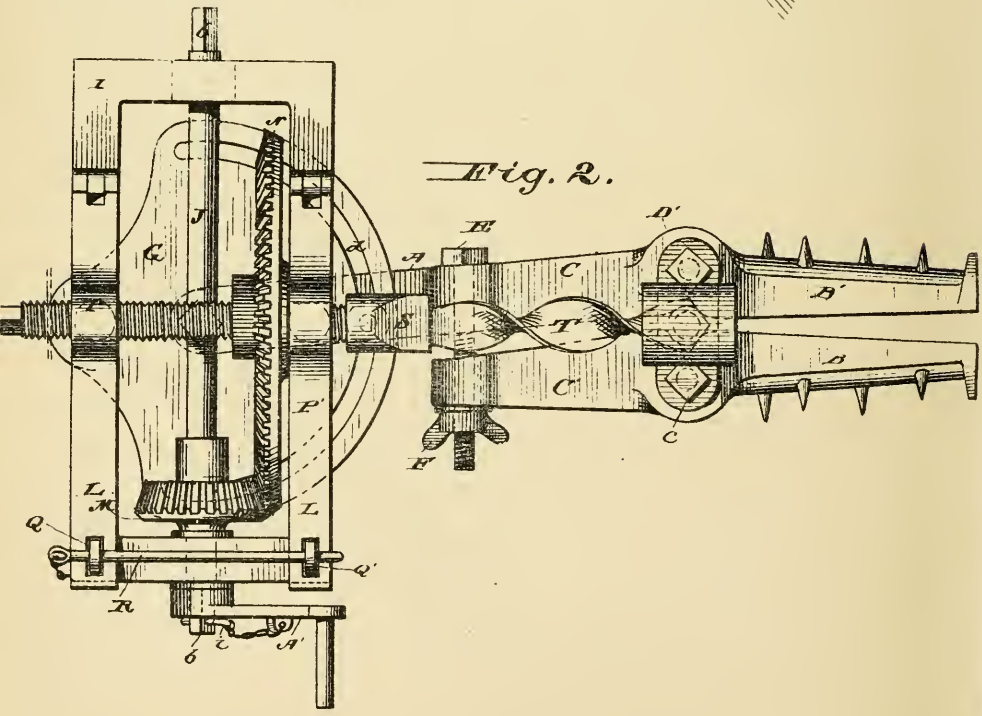


Fig. 2.



J. R. HOWELLS.
Mining-Drill.

Fig. 3.

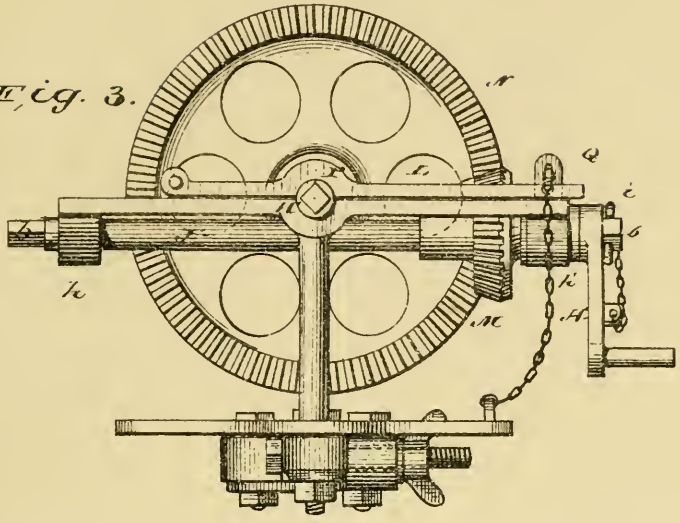



Fig. 4.

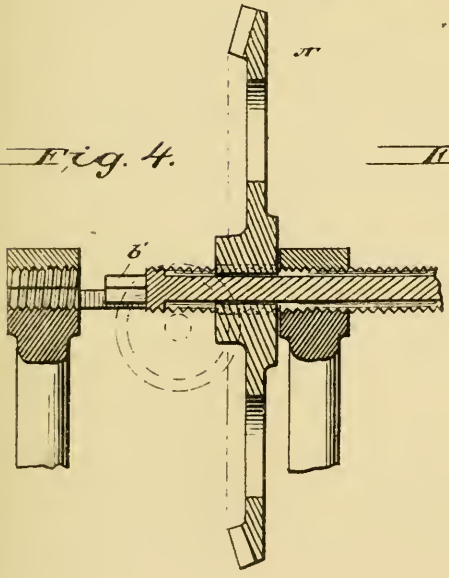



Fig. 5.

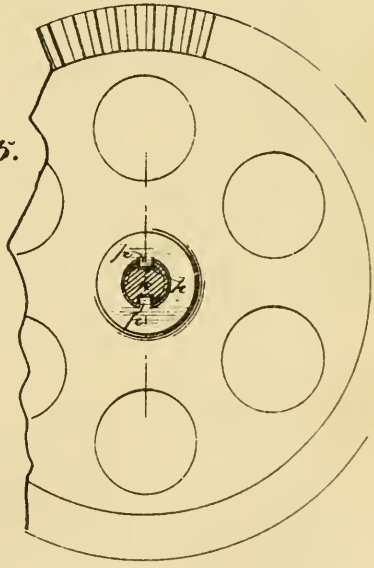


TABLE No. 8—Continued.

| Number of fan. | Location of Fan. | Fan Dimensions, Revolutions, and Water Gauge. | | | | | | Engines. | | | Discharge in cubic feet per minute. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diameter—feet. | Width—feet. | Number of side inlets. | Diameter—feet. | Revolutions per minute. | Water gauge—inches. | Number of. | Vertical or horizontal. | How connected. | |
| | *Erected 1875—Contin'd:* | | | | | | | | | | |
| 60 | Waterman & Beaver col'y, | 15 | 5 | 2 | 7.5 | . . . | . . . | . . | . . . . . | Direct, . . | 24,000 |
| 61 | Waterman & Beaver col'y, | 21 | 7 | 2 | 10 | 60 | .5 | 1 | Horizontal | Belt, . . . | 66,000 |
| 62 | Audenreid colliery, . . . | 15<br>15 | 5<br>5 | 2<br>2 | 7.5<br>7.5 | 80 | 1.2 | 2 | Vertical, . | Direct, . | 54,000 |
| | *Erected during 1876:* | | | | | | | | | | |
| 63 | Nanticoke, No. 2, slope, . | 15 | 5 | 2 | 6.5 | 76 | .75 | 1 | Vertical, . | Direct, . . | 21,181 |
| 64 | Franklin colliery, . . . . | 16<br>16 | 4.5<br>4.5 | 2<br>2 | 7.6<br>7.6 | 50 | .4 | 1<br>1 | " | " . . | 52,000 |
| 65 | Wyoming colliery, . . . . | 25 | 8 | 1 | 12.6 | 44 | .4 | 1 | Horizontal | " . . | 102,000 |
| 66 | No. 4 shaft, D. & H. C. Co., | 16 | 4 | 2 | 8 | | | | | | |
| 67 | No. 3 shaft, D. & H. C. Co., | 16 | 4 | 2 | 8 | | | | | | |
| | *Erected during 1877:* | | | | | | | | | | |
| 68 | Forty Fort colliery, . . . | 15<br>15 | 5<br>5 | 2<br>2 | 7.5<br>7.5 | . . . | . . . | 1<br>1 | Vertical, . | Direct.<br>" | |
| 69 | Sugar Notch slope, . . . . | 15 | 5 | 2 | 7.5 | . . . | . . . | 1 | " | " | |
| 70 | Nanticoke, No. 4, tunnel, | 15 | 5 | 1 | 7 | . . . | . . . | 1 | " | " | |
| | *Erected during 1878:* | | | | | | | | | | |
| 71 | Maltby colliery, . . . . . | 8 | † | 2 | . . . | 147 | . . . | 1 | Horizontal | Belt, . . . | 31,200 |
| 72 | Maltby tunnel, . . . | 6 | † | 2 | . . | 250 | .6 | 1 | " | " . . . | 25,750 |
| 73 | Nottingham colliery, . . . | 24 | 8 | 1 | 12 | . . . | . . . | 1 | " | Direct. | |
| | *Erected during 1879:* | | | | | | | | | | |
| 74 | Hollenback shaft, . . . . | 15 | 5 | 2 | 7 | . . . | . . . | 1 | Horizontal | Belt. | |
| 75 | Hutchison colliery, . . . . | 16 | 5 | 2 | 7.5 | 68 | . . . | 1 | Vertical, . | Direct, . . | 41,000 |
| 76 | Hollenback air shaft, . . . | 35 | 11 | 1 | 17 | 35 | . . . | 1 | Horizontal | " . . | 70,000 |
| 77 | Hollenback air shaft, . . | 24 | 8 | 1 | 12 | . . . | . . . | 1 | " | " | |
| 78 | No. 5, D. and H. C. Co., . | 20 | 6.5 | 2 | 10 | . . . | . . . | 1 | " | " | |
| 79 | Empire colliery, . . | 20 | 6.5 | 1 | 10 | . . . | . . . | 1 | " | " | |
| 80 | Nanticoke, No. 4, slope, . | 20 | 6.5 | 1 | 10 | 70 | . . | 1 | " | " . . | 50,000 |
| 81 | Nanticoke, No. 1, shaft, . | 20 | 6.5 | 1 | 10 | . . . | . . . | 1 | " | " | |
| 82 | Hartford colliery, . . | 25 | 8 | 1 | 12 | . | . . . | 1 | " | " | |
| 83 | Prospect shaft, | 30 | 10 | 1 | 15 | 40 | 1.25 | 1 | " | " . . | 145,620 |
| 84 | Kingston C. Co., No. 2, sh't | 25 | 8 | 1 | 12 | . . . | . . . | 1 | " | " | |

* Breaker engine. † Murphy fan.

A new fan is promised to be built at the Ellenwold shaft, and another at the Waddell drifts, early in the spring of 1880.

I here insert the drawings or sketches of a few of the most important hand-drilling machines, patented by the respective parties whose names accompany the same. This is done, not as an advertisement for the benefit of the patentees, but to show what is being done in that line, as it is generally known that we have had hand-drilling machines in operation for some time in our anthracite coal mines, and I do so without comment for or against either one.

**Second Opening.**

Conyngham Shaft.—The second opening commenced in the said shaft has not been driven any further; but a rock tunnel is being driven there through an anticlinal axis, which was met with in driving the same. This tunnel is intended to cut through said anticlinal at a point so that it reaches

about the level of the bottom part of the synclinal axis beyond the same, whereby the second opening may be continued to the point of destination in the Baltimore No. 3 slope. There is nothing else being done in the said shaft at this time.

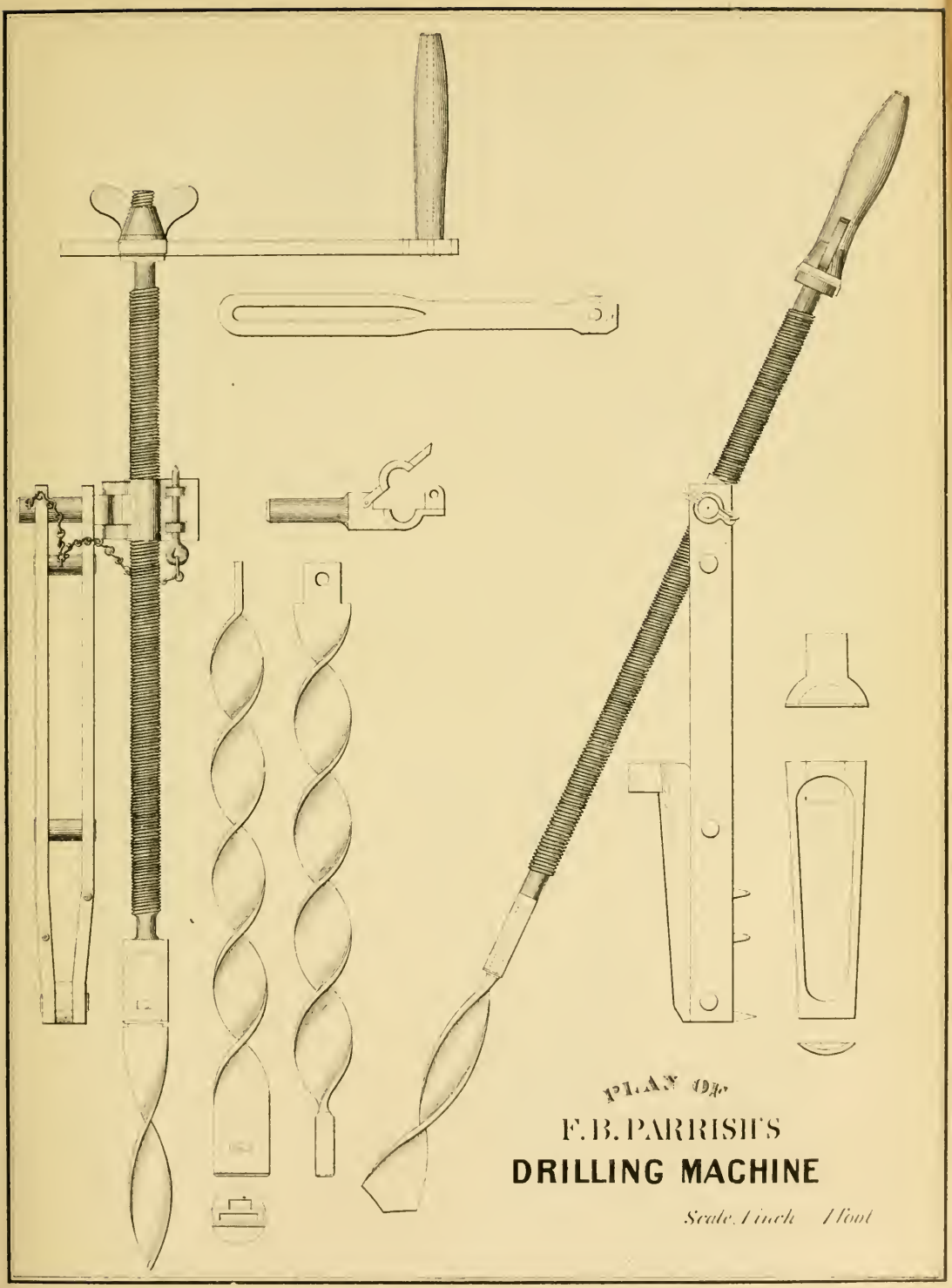
HOLLENBACK SHAFT.—This shaft is operated by Charles Parrish & Co. A second opening to the above shaft was had by driving to the air shaft sunk on the anticlinal axis between it and the Diamond shaft workings, at a distance of about fourteen hundred feet from the main or hoisting shaft. A law suit grew out of work done in the said colliery while the second opening was going on, as follows: The company commenced to drive more places than those requisite to make or facilitate the making of a lawful second opening, such as driving a gangway and air-way to the westward, while others were being driven eastward, from which the second opening proper was to be driven to the air-shaft; and finally, after remonstrating with the company's officers, and their continuance of the same, I instituted proceedings against them, by applying for an injunction to restrain them from working more than the actual number of persons required to make or facilitate the making of the said second opening, as decided by His Honor Judge Harding, in the cases of the Commonwealth *vs.* The Seneca Lake Coal Company, and Lance or Bonnell. The said decisions had been rendered, giving a construction to that part of the law, hence I had no other course to pursue. Another case bearing also on the matter of a second opening, regarding a shaft at Nanticoke, owned by the Susquehanna Coal Company, was brought up the same time, and, after a postponement or two the cases were tried, and were decided in favor of defendants in both cases, which will be found mentioned elsewhere in this report.

NO. 1 SHAFT, SUSQUEHANNA COAL COMPANY, NANTICOKE.—A second opening was secured in the upper seam operated in this shaft last year, but the one in the lower seam is not yet completed, but may be so before the time arrives to make another annual report. As mentioned above, the case of this second opening was taken into court the same time as that of the Hollenback shaft, operated by Charles Parrish & Co., and the case was decided in favor of the defendant, of which further particulars will be found under the heading of legal proceedings.

### Legal Proceedings.

The only cases taken into the courts this year by the writer were two, and both regarding the matter of second openings.

The one was that against Messrs. Charles Parrish & Co., operating mines of the Lehigh and Wilkes-Barre Coal Company, and the one here referred to, called Hollenback shaft. The courts having decided the points involved in this case, as I thought, several years ago, in the case of the Commonwealth, *ex. relatione*, Thomas M. Williams, inspector of mines for the Middle district of Luzerne and Carbon counties, *vs.* Samuel Bonnell, junior, William L. Lance, senior, Walter W. Lance, and De Haven Lance.—No. 6, October term, 1871. In equity.



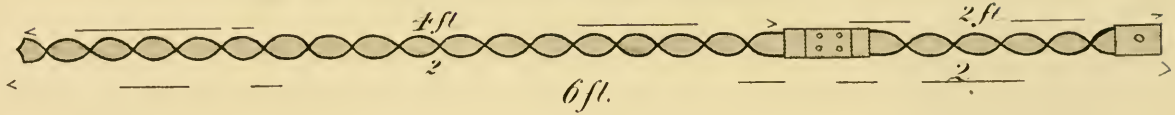
PLAN OF

F. B. PARRISH'S

**DRILLING MACHINE**

*Scale 1 inch 1 foot*

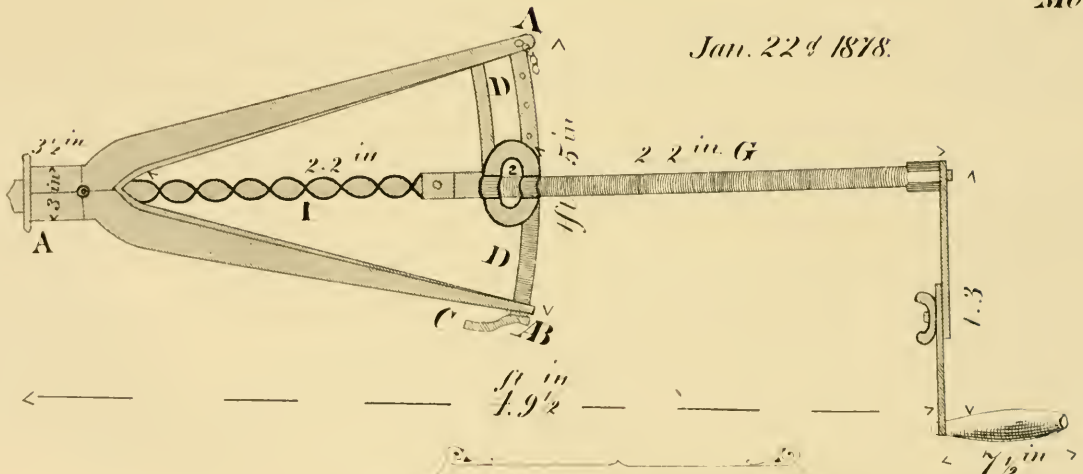
# COAL BORING MACHINE




*Patented by Duncan McMurtre*

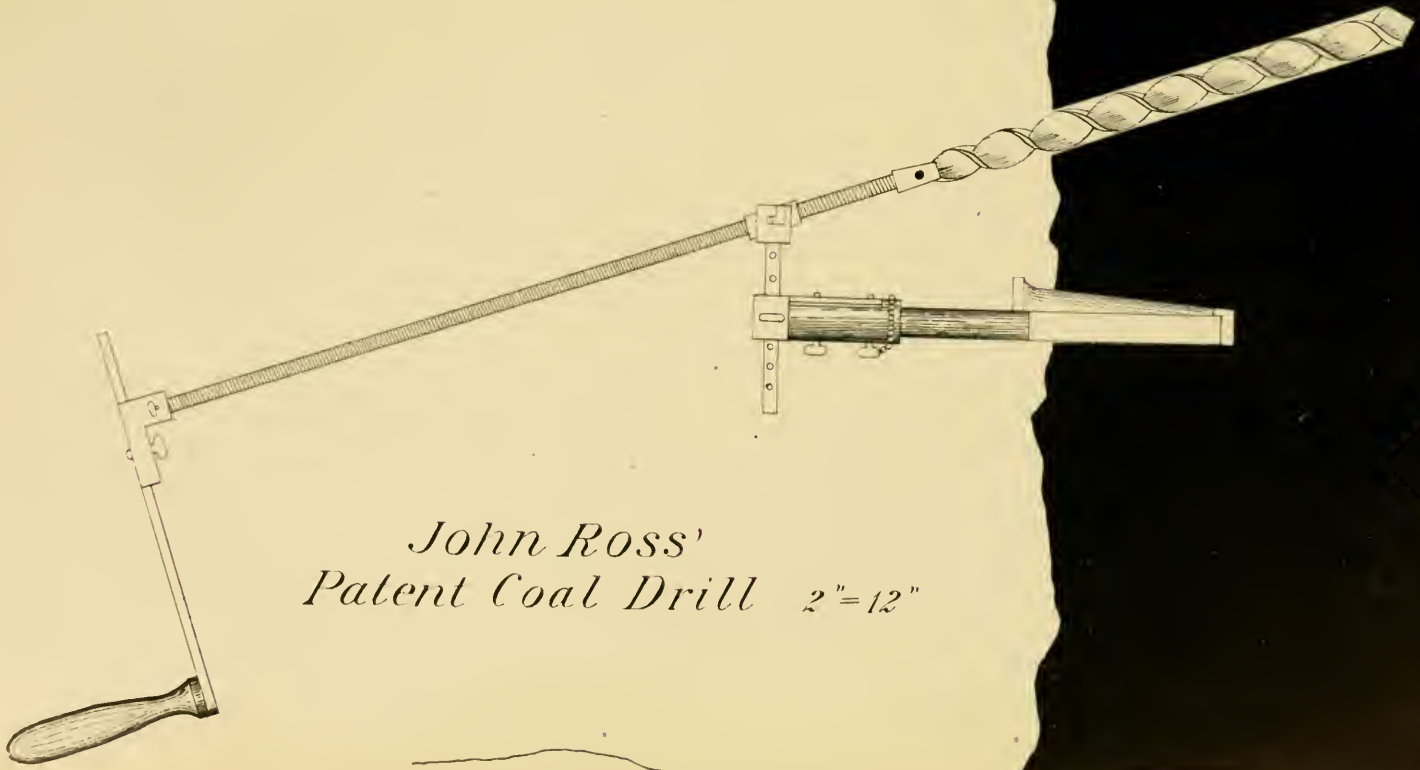
*Moosic, Pa.*

*Jan. 22d 1878.*




*1 Inch to a Foot.*

*S. Cron.*



*John Ross'*
*Patent Coal Drill* 2"=12"

The Hollenback shaft has been sunk to the Baltimore seam, and reached it at a depth of some five or six hundred feet, where a very large quantity of carbureted hydrogen gas is generated, requiring extra ventilation and care, which is shown by the following: One day the belt driving the fan slipped, causing a reduction in the speed of the ventilator. A messenger was immediately sent down the shaft, on the carriage, to acquaint the men of the fact, but before he had reached the shaft foot an explosion had already taken place, and two persons more or less burnt on faces and hands, in one of the narrow workings.

I then observed that more persons were there employed than were necessary to make or facilitate the making of the second opening. Such as the driving of a gangway and air-way to the west, while another gangway and its parallel air-way was being driven to the east, from which the outlets were to be driven to reach the second opening or air-shaft, at a distance from the shaft of about fourteen hundred feet; as, also, another party driving a place below the latter air-way eastward, to be used as air-way and empty road for future use. Besides the above, there was no speaking-tube in, nor cover on, carriage. The safety-catches were not satisfactory.

When I mentioned this matter to the officers, I was met with the statement that the whole number employed did not exceed twenty persons at one and the same time. I then served the officers with a written notice that, according to His Honor Judge Harding's decision, there could be no more persons employed, in any mine not having a lawful second opening, than the number required to make or facilitate the making of a second opening, and that number *not to exceed twenty persons* at one and the same time. I also notified them that unless they desisted from what I thought was a violation of the law, *as construed by the Court, as above referred to*, I would at once bring the matter before the court, which I subsequently did. After a length of time the matter was reached, and decided in favor of the defendant.

I will here give abstracts of the decision above referred to, which led me to believe it my duty to do as I did in this case, to wit, (see Bonnell case:) "No matter though it be urged that operators, lessees, and agents of mines or collieries of this character are doing all they can to drive these second openings; and that the work in each case is of great magnitude, requiring large outlays, both of capital and labor, but also that time, of wide limit, is necessary for their completion, severally. Still, however true this may be, when violations of this law, as alleged in this bill, and which have not been formally contradicted, are brought to our notice, and the *power of the court is evoked to check them*, we can, officially, only know what the law is, and knowing it, in the discharge of our plain duty, we shall administer it, albeit this colliery, and a dozen others like it, in the region, be brought to a stand still."

And further, in the same case: "Adopting this as the correct interpretation of the statute, the inquiry is still extended as to how the twenty per-

sons shall be permitted to work. We are aware that there exists a difference of opinion on this subject, as well among lawyers as *laymen*; and that, in many instances, in this coal region, operators, while keeping within the limit of twenty persons in working *through coal* for a second outlet, have, in accordance with their own construction of the law, worked sometimes fifteen or eighteen persons in cutting coal for market, while only five, oftener only two, have been employed in driving for the second outlet."

Then, again, same case: "*Cutting coal for market*, therefore, whether with one man or twenty men, except in so far as it is necessary incident of driving on through a seam or *stratum* towards a second outlet, is not only a declared purpose of the statute, but, on the contrary, it is in direct and absolute contravention of the expressed terms thereof."

The above points in the aforementioned decision, appeared to the writer to mean that in no case could there be more than the necessary number of persons requisite for the driving, or facilitate the driving, or securing of a second opening, and even that number limited to not exceed twenty persons. And knowing that more than the number required to work, or used in the work of driving for such second opening were there employed, I inferred that it was my duty to bring the matter to the notice of the court; and, failing to do so, should any accident occur, or even without, I had the impression that a case of neglect of duty could be instituted against me. Those were the reasons the writer had, independant of his own idea of duty and his own views on the questions involved in the case.

The other case, aforementioned, was somewhat different from any other brought before the court in this district, the facts in the case being as follows, to wit:

The No. 1 shaft of the Susquehanna Coal Company is located in Hanover township, a short distance south-west of the town of Nanticoke. Two seams of coal are being worked, at present, in said shaft. The upper one is the Hillman or Primrose seam, which has a second opening made to the No. 2 slope. Then, about one hundred and fifty feet below the Hillman, the seam in question was being worked, but only for the purpose of making a second opening, employing only the number actually necessary to make the same, having some time ago, at my request, stopped a few others whom they thought they had a right to work, and yet confine themselves within the limit of the "twenty persons" clause.

The question arose in my mind since, that the mining of coal had been increased, and, as a matter of course, the hoisting of the same, since a second opening had been secured in the upper seam worked, whether, in case an accident from fire, or any other catastrophe, should occur, whereby the men in the lower seam should be endangered, whether or not the question would be asked, "*Had* the company any legal right to work the lower seam and upper seam at one and the same time, so long as the lower one had no second opening?" and that the dangers were very much increased in the lower one by the increase of work done in the upper seam,

from explosions, should any occur, and especially so in the additional work of the machinery about the shaft. In fact, the decision of His Honor Judge Harding in the case cited, in connection with the Hollenback case, calls attention to the increased danger caused by hoisting and preparing coal about a shaft head.

It is true, there was no coal breaker connected with this head house, but there was as much lumber in the said head house as many of our old-fashioned breakers contained. Then, again, the said decision prohibits the hoisting of coal where it can be stocked inside the mine, to obviate the increased danger. And these points, the writer thought, might be construed to mean that though a colliery, or shaft, had a second opening in an upper seam, it could not employ persons in a seam below, even to make a second opening, at one and the same time. So the matter was submitted to the court at the same time as that of the Hollenback shaft case, and a decision rendered, in course of time, in favor of the defendant.

## DESCRIPTIVE PART, RELATING TO FATAL ACCIDENTS.

### Fatal Accidents by Explosions of Gas.

The number of deaths resulting from explosions and burnings from carbureted hydrogen gas, or fire damp, as generally called by miners, during the year last past, has been greater than in any other year since the passage of the law in 1870. There having been thirteen lives lost during the year, giving a per centage of twenty per cent. of the whole number, which is sixty-five, an unusually large number, the percentage of last year was nineteen and forty-four hundredths (19.44.) The average for the last, and preceding five years, was only twelve and five hundredths (12.05) per cent. of the whole number.

In the year 1877, one life was lost under this head, while in 1874, nine were lost—this shows the great uncertainty of this item. In the English reports during 1877, the percentage of this item was twenty-eight and fifty-six hundredths (28.56) per cent., while in 1878, the same item ran up to forty-one and forty-seventh hundredths (41.47) per cent. Total killed in England, being twelve hundred and eight in 1877, and fourteen hundred and thirteen in 1878, while the number killed by explosions of fire damp, were three hundred and forty-five for 1877, and five hundred and eighty-six for 1878, and from falls of material in 1877, the number was four hundred and forty-eight, and in 1878, it was four hundred and sixty-nine, and percentages of 37.08, and 33.19 respectively. The whole number of lives lost under this head in this district last year, were lost by three different causes—there having been five lives lost by one, and six by another, and one by the other. Further explanations will be found as the respective cases are treated upon.

Accident No. 15.—William Smith, David B. Morgan, John Davis, William Watkins, Sem. Lloyd, and Richard Faull, all practical miners, were fatally injured, by being burned by gas, while in the act, part of them, and all employed to assist in their endeavors to extinguish a fire in the Auden-

ried shaft colliery, on the sixth day of May last, the details of which, to the best of the writer's knowledge, after a careful inquiry, are as follows:

Mr. Joseph Weir, the mine boss, and Joshua Davis, a fire boss, traveled a part of the colliery known to the workmen of said mine, as the North-west side, through the faces of the working places outward, and passed a point known as the head of the proving or test-hole, about eleven o'clock, A. M. They stated, that knowing that there were strong feeders or jets of gas in the said test-hole, they extinguished their lamps, (that is their naked lights,) just as they were about to leave a cross-cut from the next place inside, into the said test-hole. There was some brattice of either cloth or boards, at the said point. They then went forward on their trip by the light of their safety-lamps for some distance. In the course of an hour and a half, or two hours, they entered a point of the return air-way from the said part of the mine, when they at once found the scent of something burning, and immediately concluded that there was fire in the aforesaid proving-hole, which was hundreds of yards away from them at this point. They, as a matter of course, repaired towards the proving-hole by way of the tunnel, and there found a strong fire burning from the gas feeders, and what loose coal that was around there, some of which, no doubt, if not all, had already been loosened by the effect of the said fire. No one else than the said officers were known to have been through the said part of the working about that time, and much speculation has been had regarding the origin of the said fire. There were parties working near the lower end of said hole, a distance of about five hundred feet from the origin of the fire, and another party some six or eight chambers to the west of the same. These parties all knew the danger of taking a naked light to the said section. In fact, one of the workmen in the said chambers, had, on a previous occasion, been to the test-hole for lumber, and had ignited the gas feeders there, but his reporting the case immediately, the fire was extinguished, but the miner was suspended for some two or three weeks, for having gone to the said place with naked light, &c. This being known to the miners and workmen at both ends of said proving-hole, it is hardly probable that they ventured there again with naked lights, and they all denied any knowledge of the same. Some persons placed the origin as the carelessness of some of the workmen, others went so far as to intimate it might have been done designedly, or in other words, an act of incendiaryism. While it is possible, but not probable, that either of the above theories might be correct, I rather believe that it occurred from sparks igniting some tinder, chips, or rags lying in the vicinity of the cross-cut, where the mine boss and fire boss extinguished their naked lamps on entering the proving-hole, and that this was fanned by the air-current into flames, which in time, ignited the brattice thereabouts, and from there the gas feeders, unless a small gas feeder should have been first ignited to give it the start.

The lights from the naked lights being put out, and the officers having nothing but the dim light of the safety-lamp, its origin might easily have

escaped their notice, as they, no doubt, moved away just as they extinguished their naked lamp-lights, as they had to light their safety-lamps in advance, and, being in a current, it would not be a desirable place to stop. Another reason I have to think this reasoning to be the correct one is this, that Mr. William Smyth, sometime before the men were burned, had made an inspection of the proving hole, from the south side up to near the said cross-cut, and saw that the brattice that was formerly there had been burned down, but that the fire then was all higher up on the apex or top of the anticlinal. Mr. Smyth said he thought from that that the fire must have been started from that point. I agree with him in that of its location, but disagree as to how it originated. So much as to the origin of the said fire.

As soon as the fire was discovered a force of men were at once employed to combat it by carrying water from the shaft level gangway, at the tunnel end, as they had no water-works at hand. Finally they connected the pipes used to carry compressed air to drive the rock tunnel to the pump column at the shaft, when the great pressure burst the receiver, which again delayed them considerable, but in time this difficulty was overcome, and a stream carried to the fire. The feeders along the hole for hundreds of feet, had taken fire by this time, but they were struck out very rapidly by the water, until they forced it to the top of the anticlinal or near the location of its origin. By this time considerable top coal had become loosened, and the same was burning fiercely, and every now and then the subdued flames would burst out afresh and ignite the gas feeders on either side of the hole, when the workmen would be forced to retreat down the said narrow passage in the direction of the gangway and tunnel mouth, from which they got their, by that time, scanty supply of fresh air, as the place was getting warmer each and every moment.

About eleven o'clock, P. M., Mr. F. B. Parrish, assistant superintendent, called at my residence, when I was first informed of the fire, and I immediately repaired to the mine, and in a short time afterwards, descended the shaft, in company with Messrs. Joseph Harris, mining engineer for the receivers of the Lehigh and Wilkes-Barre Coal Company; George H. Parrish, superintendent, and F. B. Parrish, assistant superintendent and mining engineer for Charles Parrish & Co.; also, Mr. Dodge. While in the fireman's station, preparing lamps and examining the mine map, preparatory to going to the location of the fire, a messenger came running with the news that a large number of the workmen in the proving hole had been burned seriously. The party at once started towards the scene of the accident, and met the injured men being assisted out by their more fortunate comrades, when we learned that the persons above named, and two others, named John Richards and Levi Gibbons, were dangerously burned. It would seem, from information obtained from parties who were in the proving hole, as it was called, that a short time prior to the men being burned, that they had been driven down from the anticlinal for hundreds of feet, by the ignition of the gas feeders along the sides. It now being about the

time to change shift, new hands were on the spot to relieve those who had been there for many hours previous ; but Messrs. Smith and Faull having proved themselves very good and brave in handling the hose and facing the dangers, they were asked to remain for another shift, which they agreed to do ; and they took hold again, and applied the hose with renewed vigor, and, with the assistance of others to pull the hose, forced their way rapidly to the point from which they had been compelled to retreat a short time previously, quenching the gas feeders as they went along. At the critical moment, the feeders had all been put out that were in view, and no light perceptible, except that from a safety lamp or two. The air had become very warm, and some gas could be detected on the flame of the safety lamp, when William Howells, one of the fire bosses, informed the men Smith and Faull, that they better retreat, as the condition of the air was getting to be dangerous. They replied, "that he should take care of the lamp, that they were all right." Howells then cautioned them again, receiving about the same reply, and he moved down the hole a short distance, when suddenly the flames burst out from under the heap of loose coals under the feet of Smith and Faull, and they immediately applied the power of the hose, and tried to check the flames, but it was no use, as they (the flames) then rushed over and on either side, igniting the strong feeders along the hole and down before them for hundreds of feet. This, as a matter of course, caused a retreat of all hands, and even caused the men to be panic-stricken.

The men burned, with the exception of Smith and Faull, were not long in the mine, having changed shift after eleven, P. M. This, added to their misfortune, as they were all sitting down in the dark, on either side of the hole, ready to assist in moving the hose when required, or in turn relieve Smith and Faull. Then, when the gas burst out in flames just as a torpedo, or shell almost, the strange men ran wildly down the test-hole, through the fiery channel, until some of them fell when they were injured considerably from the roughness of the place they had to pass through, besides being burned, and in one case no less than three of the unfortunate beings were jammed between a prop, and the side having fallen on one another after the first got fast. The men all agree in their statements, that there was no concussion felt from the gas igniting, and that the burning was caused mostly by the feeders on both sides. There were several persons in the hole, a short distance below those at the hose who were not burnt at all. Amongst them were Howells, the fire boss, and Loyd, another fire boss, and Weir, the mine boss, with a few others. The officers stated that there were some eight thousand cubic feet of air passing through the tunnel and up through the said test-hole previous to and on the day of the occurrence of this terrible calamity. No doubt in my mind but that the cross-cuts on the anticlinal had by this time been partially closed by the heat and fire, thereby reducing the ventilation. Then again, it is plain that it was a grave mistake to let the men Smith and Faull force their way so rapidly to

the top of the anticlinal, without first having taken ample time to cool the top and sides, as well as put out the flames as they went along. In that way there would have been a less amount of gas given off, the place being so much cooler, which would also enable the men to stand more exertions, and the gas would not be so strong about the feeders. Then, again, when the officers observed that the current was being adulterated by the appearance of the flame of the safety lamp, and that it was liable to become to an explosive point, and that the flames were also liable to burst out from the coals underneath the workmen, thereby igniting the said charged current, then I say that the men should have been withdrawn. Mr. Weir, the mine boss, was in the hole at a point below, and this matter should have been attended to when or before Howells, his subordinate, called attention to the matter. In fact, it is only a wonder that matters did not happen even more severe than they did. I learned that some time before this burning of the poor men, Mr. Smyth, superintendent, and Joseph Edwards, had made examination of the north-west side, south of the anticlinal, and that they found the mine full of explosive gas on the west and inside of the said proving hole, when Mr. Smyth went out to report to the other officials and change his wet clothing and get something to eat, having been in the mines for many hours. Then I say, what wonder would it have been had this great reservoir of explosive gas ignited and exploded, thereby killing instantly each and every living being within the mine. This condition of things proves pretty conclusively that the ventilation had been obstructed at the junction of the current from the west side, and that from the proving hole in the vicinity of the cross-cuts, there being two of them in the pillar between it and the next place east, and the coal very thick, free and full of slips.

Had our party been down a few moments sooner, or had the gas not ignited for a few moments longer, no doubt the writer and some others of the party would have been in the said proving hole. What the result of our getting there would have been cannot well be guessed, but it is possible, however, that the sad fate of the men might have been different, or it might be that we would have shared their terrible end.

As soon as the men injured were all taken out, the question of further operations was at once discussed. Mr. Smyth giving it as his opinion that the place was very dangerous to risk any further work. The condition of the place was described by the parties present, including a statement from Mr. Smyth, about the west side workings having been found full of gas before he went out, &c. The writer then suggested that further efforts to combat the fire with hose be at once abandoned, and that the mine be flooded; Messrs. Parrish and Smyth at once agreeing. When Mr. Harris suggested the matter of walling off, and cut off the supply of air, then the writer asked how could it be done, as it was too dangerous an operation, and that should such a thing be attempted the men at work on the same would be all blown to eternity before they could complete the walling, as suggested, in the tunnels or at any other points, and I protested against

any such a thing. This view of the case was finally shared in and indorsed by those present, and the matter of flooding the mine was determined upon. In course of further discussion, it was next suggested by Mr. Harris that the fan be stopped, in order to decrease the force of the fire. The writer again suggested the almost certainty of the said plan in causing immediate and terrible explosions, and recommending, instead, that the fan speed be left unchanged, so that the change be more gradual, being caused as the water would fill up in the mine, and that should there finally be an explosion, it would not be so severe, as the water would act as a cushion. This last view was also indorsed and carried out, and without any bad results. An explosion did, undoubtedly, take place on the west side, at some subsequent period, yet such was not felt by any person about the fan or shaft.

The mules were then taken out, the bottom of the shaft fenced off, and loose boards, &c., fastened, after which the water from the Empire mine was turned into the mine, and in due time the creek was also used to help fill the burning mine. This is the end of the first scene in a series of awful, yet interesting incidents belonging to this mine, for the year 1879.

ACCIDENT No. 18.—Samuel J. Davis, a miner, working in the Wyoming colliery, operated by J. H. Swoyer, esquire, as a company hand, putting in brattices, &c., on the 28th day of June, was fatally injured by being burnt by the explosion of a quantity of gas, which had accumulated in the face of the gangway, caused by a piece of roof falling, and breaking down the wooden brattice. The unfortunate occurrence was the natural consequence of carelessness on the part of Davis himself, together with his partner, named Evans, who was also very severely, though not fatally burned. Another person, named Frahill, who worked the said gangway, was also very severely burned at the same time, but he also recovered. After that the brattice was broken down, the gangway man sent for the company men to repair the same. And they went there, and had put back three of the four boards displaced, and the man Frahill observing that they had their naked lights with them, and knowing, as they also did, that the gas was full inside the point around which the air cut short, he lit his safety-lamp, and went in to request them to put out their naked light, and to warn them of the danger they were in. He had scarcely reached the spot, when an explosion took place, with the result above mentioned. Davis lingered for several days, in terrible agony and pain, resulting in his death.

It so happened that I was through the said mine the same day, not having left the head of the colliery when the news of the explosion was received on top. In fact, I was just descending from the breaker, having been through it since ascending the shaft, being then about three o'clock, P. M. I had met the said party, Davis and Evans, at two or three different points through the mines, from about nine o'clock in the morning until I left. Like myself, they were moving from place to place. I had also examined the place where the explosion occurred, as well as each and every other working-place in the whole mine. It happened in the face of a gang-

way generating considerable gas, and I had measured the quantity of air circulating or passing the said point, and found fifteen thousand six hundred cubic feet of air per minute passing not far from the face. The inside cross-cut was back a few yards, but there was a brattice from it to the face, and a canvass across the gangway just outside. I had cautioned Mr. J. B. Jones, the mine boss, when going through there, that they had too much loose coal at the face, and not space large enough behind the brattice to get the full benefit of a large current. Also, that they had a very good current, but that it must be still larger, and that at least twenty thousand cubic feet per minute was required in the said section.

There were altogether some thirteen places being worked in the said section, yet I do not think that anything of which I complained would have caused the accident, or their remedy have prevented the same, as the brattice having been broken right opposite the cross-cut, the air could not be expected to pass to and around the face of the gangway, no matter how much the current, as it had the whole brattice nearly down, and free exit out from the cross-cut.

Accident No. 44.—Zachariah Thomas, David Jenkins, William Kinney, George Forsythe, and David Rupp, were all instantly killed by a terrible explosion of fire-damp, in No. 9 lift in the Mill slope, on the 2d day of November, 1879, being on a Sunday morning. The two first named were very much burned, while the other three were not burned at all, but had evidently been killed by the concussion, or blast of wind produced by the explosion of gas, ignited from the lamps of the one or the other of the two men, Thomas and Jenkins, who were so badly burned.

The Mill Creek colliery is operated by the Delaware and Hudson Coal Company, Mr. John Cook being mine boss, and Mr. A. H. Vandling superintendent, assisted by Mr. C. H. Scharar, mining engineer. The mine has always been a very gassy one, but having good ventilation and careful management, it has been extraordinarily free from accidents from explosion of gas. The above statement will be found true, by examination of the accident list from 1870 to the time of this occurrence. Many years ago, the gangways and air-ways were very small, which I condemned severely. The air-crossings or bridges were also of the same kind, entirely inadequate in size, but all this was soon changed, and large and roomy air-ways, gangways, and air-bridges were had, and an aggregate of one hundred and thirty thousand cubic feet of air was mostly kept in circulation in the various splits, there being from five to six and eight splits. The mine has got to be very extensive, the slope being down about three thousand three hundred feet. There being a flat part way down, an engine was placed there, to hoist from the lower one thousand feet. Work was being done in the Nos. 3, 6, and 7 on the left, Nos. 10, 9, 8, 7, 6, 5, and 4 on the right, up to the time the explosion occurred.

On Saturday, the 1st day of November, there being a crush in some part of the No. 9 lift, work was suspended there, and a number of the men put

to work to timber along certain parts of the gangway and air-way, and Mr. Cook, the mine boss, and a gang of men worked until about midnight, when they quit work, the place being rather unsafe, as they supposed. On Sunday morning early, Mr. Cook, accompanied by a young boy, went down the slope to learn the condition of No. 9 lift, along the gangway where they had been timbering, and while there formed an opinion that the crush was not so bad as it had been, and that his first idea of timbering the gangway to prevent the spread of the crush beyond a certain section, could then be carried out. So he went out, and, on reaching the surface, sent the lad, aforementioned, to the houses of some of his workmen to ask them if they would go to work, (this being Sunday morning,) while he started home to get his breakfast. On his road home, he met two of the men, who had lamps, and he asked them where they were going, and they replied they were going into the mine to get their tools, when he asked them if they would have any objections to work this day, and they assented. He then requested them to go and see some other parties for the same purpose. One of these men had been in the party timbering Saturday night. These two men and three others, five altogether, were not seen again by Mr. Cook nor any other officer, until their corpses were brought out of the mine, after the explosion.

When Mr. Cook returned from his breakfast, he was informed soon, by the engineer, that a gust of wind and dust was seen thrown out of the mouth of the slope. And it being a downcast, Cook knew there was something very wrong, but he stated he thought it probably was a concussion from a cave of roof. He then descended the slope until he came where the walls had been blown down, then he returned, and after getting assistance, explored the No. 9 lift, where they found the bodies of Kinney, Forsyth, and Rupp, but those of Thomas and Jenkins were not found in No. 9, but were found at the entrance from No. 8 to the No. 9 lift, second opening. It appears that the man Jenkins had not been to work on Saturday, but that he worked walling stoppings in the said second opening, or plastering the same, as the air current then passing across said place towards the return was about to be closed off, in order to make the said second opening and traveling-way an intake air-way. More than likely that Jenkins went there to get his tools to go to work at the timbering, on the No. 9 gangway, with the other three men who had gone down there, and probably that Thomas had gone with him for company. It is very evident that the gas was ignited by the lamp of one of them, probably the former, as his body was found inside the entrance to the second opening, while that of Thomas was found in the No. 8 lift gangway, a trifle outside of the said entrance, which might have been carried there by the blast or concussion. The three men killed in the gangway of No. 9, from which the gas came, were killed by the concussion caused by the said explosion, just as they were about going towards the section, where the timber had been put up the night before. The gas had, no doubt, been given off by a caving of the roof of

several chambers in the No. 9 lift, letting off the gas from the upper bed of the Baltimore seam, or top vein, as they call it, to such an extent as to adulterate the whole stream or current of air, which was about thirteen thousand cubic feet per minute. Before this cave, the current was free from the presence of gas. The top seam or bed generates gas very fast, and it has not been worked over the area of the cave.

Mr. Cook claimed that he had not intended the men to have entered the mine before his return from breakfast. His having conversed with two of the men, and giving them instructions to seek other men, and then, again, for these men to have gone on their way to the place where he wanted the work done, would rather indicate an understanding by them of their duties to be performed. He also gave as his reply to the question, why he had allowed the said men to go down into the mine before a fire boss or himself had examined the condition of the place, "that it was a standing rule that no persons were allowed to enter the mine until the same had been done, &c., &c., and that he had no reason to suppose that they would enter in this case, before himself or his fire boss should give them information that such was the case."

The unfortunate men having all been found dead, there was no one left to give their side of the case, and it certainly looks rather a doubtful case; yet there is no proof, that I heard, to warrant the inspector in saying that Mr. Cook had sent those men into the mine, and the reader must draw his own conclusion from what has been stated. When in attendance at the inquest, I gave it as my opinion that there was nothing proven that Mr. Cook had neglected in carrying out the law, yet, in view of the great importance of the case of a cave, it was my opinion, that it being an *extraordinary* circumstance, Mr. Cook should have taken *extra care*, and should have cautioned the men he saw *not* to enter the mine, and informed the boy to request the parties he went to see, that they should *not* enter the mine until they saw Mr. Cook or his fire boss, &c., &c. But instead of that, Mr. Cook, I fear, did not think the danger was so great; in fact, it is doubtful whether he thought about the possibility of large quantities of gas being liberated therefrom. He had been down in the mine early that morning, and went along the main gangway, carrying a naked lamp so far as he went. It is true, he did not go so far as the face of the mine or workings, yet it appears as if Mr. Cook had not the slightest thought of the accumulation of gas, or he would not have gone so far as he did, not knowing anything of its condition, except that there was a pretty strong current of air on the main gangway; and I doubt whether he had any thought of gas, even in the return, and that it was more by luck than real thought, that he did not himself ignite the said gas. On the other hand, if he did at all think of the possibility or probability of gas being met in an explosive state in the said return, then his act of neglect could not have been questioned, for which he should be made to suffer the penalty of the law.

Below will be found a copy of the verdict of the jury, as given to me by Mr. Evan Morgan, (justice of the peace,) acting coroner. The testimony I have not inserted, for the reason of its imperfect condition. Many important questions and replies are omitted in connection with the testimony of Messrs. Cook and Foot, the latter being the outside foreman, and having control of engines and of fans, &c., &c. There are also questions and replies given entirely inaccurate; hence I left out the whole as being inaccurate and deficient in the case, and give the conclusions arrived at by the jury, to wit:

**Inquest.**

An inquisition indented and taken at Plains township, in the county of Luzerne, the 3d day of November, in the year of our Lord one thousand eight hundred and seventy-nine, (1879,) before me, Evan T. Morgan, one of the justices of the peace in and for the county of Luzerne, upon the view of bodies of David Jenkins, Zachariah Thomas, Daniel Roop, George Forsyth, and William Kenny, then and there lying dead, upon the oaths of Owen Griffith, William Tasker, Aaron Hilbert, Michael Mayock, George Ayres, and Winthrop Oplinger, good and lawful men of the county aforesaid, who, being sworn to inquire, on the part of the Commonwealth, when, where, how, and after what manner the said David Jenkins, Zachariah Thomas, Daniel Roop, George Forsyth, and William Kenny came to their death, do say, upon their oaths, that David Jenkins, Zachariah Thomas, on the 2d day of November, A. D. 1879, came to their death in Mill Creek mine, by the explosion of carbureted hydrogen gas, supposed to be ignited from a light carried by the said David Jenkins, in the traveling road, between Nos. 8 and 9 lifts of said mines, and that by the concussion of the same, Daniel Roop, George Forsyth, and William Kenny came to their death. And the said jurors further say, upon their oaths, that John E. Cook, inside foreman of said Mill Creek mine, is guilty of gross neglect, in not ascertaining whether the condition of the said mines were free from danger previous to the men entering the said mines, Sunday, the 2d day of November, 1879. And further say, that the unfortunate men that came to their death were also neglectful in not inquiring whether the said mines were free from danger previous to entering. And further recommend that a more diligent watch be kept over the fans of the said mines.

In witness whereof, as well the aforesaid justice, as the jurors aforesaid, have to this inquisition put their hands and seals, this 6th day of November, A. D. 1879.

EVAN T. MORGAN, [L. S.]
*Justice of the Peace.*
OWEN GRIFFITHS, [L. S.]
WILLIAM TASKER, [L. S.]
AARON HILBERT, [L. S.]
MICHAEL MAYOCK, [L. S.]
GEORGE AYRES, JR., [L. S.]
WINTHROP OPLINGER, [L. S.]

By Falls of Roof and Sides.

Accident No. 2.—James Boyle, a young man who was working as laborer for his father, Patrick Boyle, in the Audenried colliery, on the 13th day of January, was instantly killed while within a few feet of his father, by a piece of coal from roof, no doubt purely accidental, as the roof was so high, that the bad piece could not be detected.

Accident No. 4.—Patrick Maloney, a laborer, working in No. 2 colliery, Kingston Coal Company, on the 27th day of January, was killed by a fall of coal, while in the act of loading a car. The piece that fell was quite large, and had been considered very safe. A slip in the side out of sight, loosened it, and no doubt the case was purely an accidental one.

Accident No. 6.—Samuel Smith, a driver boy, aged 16 years, working in Wyoming colliery on the 7th of March, was killed by a fall of rider coal on the main gangway. The cause of the said fall, was by a mule having run away, and in his wild freaks ran towards, and out along the said main road, and on the way met, or came in contact with another mule which the boy Smith was driving, and both being in motion, they struck to the one side of the track, and one of them caught between car and a prop, and it was forced out of its place, when immediately a large flake of top coal, called rider coal, broke away from a slip, and crushed the boy Smith, as above stated; and all, so far as I could see, accidental.

Accident No. 7.—Thomas Ruthford, a miner, working a chamber in No. 2 colliery, Delaware and Hudson Coal company, Plymouth, on the 12th day of March, was killed instantly by a piece of coal falling on him in face of chamber. An accidental case.

Accident No. 8.—Peter Hess and Peter Fredericks, two partners, working a chamber in Exeter colliery on the 15th of March, were killed by a fall of rock. This was a singular case. The two men lived a considerable distance from the mines, and not returning to their homes during the evening or night, so on the next morning a search was made, and their corpses found under the fallen rock. Strange to say, the night fire boss had been twice through the chamber, and within a few feet of the unfortunate beings during the time their bodies were there covered up. How it happened is hard to tell, but it is supposed to have occurred while timbering. There being bad roof at the said point, and their timbering previously done was very imperfect, and not a good and workmanlike job. There are very bad pieces of roof in this mine, besides the slate intervening between the mining bench and the top bench or rider coal, which is called by the miners black rock, and sometimes called "man killer." It is an extraordinary bad and a difficult slate to take care of, being of a fire-clay nature, it disintegrates easily, and is very treacherous; hence, there are in this mine, where a large number of persons are employed, and coal produced, a great many accidents, and most of these from falls of roof, notwithstanding that the officers exercise great care, and furnish plenty of good and valuable timber.

Accident No. 9.—James Griffith, a miner, and Edward Mitchell, his la-

borer, working in the Empire colliery, belonging to Charles Parrish & Co., were instantly killed by a fall of top coal on the 24th day of March. Griffiths was a miner of long experience, and an excellent workman—rather too daring. His laborer had only worked a short time in the mines, being a machinist, and forced by his circumstances to accept a job in the mines temporarily, and had declared to his wife, when leaving his little family in the morning, that he would quit the mines after that days work, after which they were separated, never to meet in this life.

The coal that fell on the above was a part of the top coal, known to the men there by the name of heartshorn, and it was fast at the outer edge, but became loosened from the inside outward, whereby they were deceived and trapped. They were found by their comrades, working in the adjoining places, after they had failed to see them when seeking them to go home.

ACCIDENT No. 12.—Stephen Corrighan, a miner, working in No. 10 slope, Sugar Notch colliery, was fatally injured by piece of fire-clay and rider coal falling on him in main gangway, when going to his work on the 14th day of April. In about one week from the accident to Mr. Corrighan, the great cave of Sugar Notch occurred, and it extended over the same area and locality, where he received his fatal wounds. The piece that fell was not very large, but it had quite a height to fall, the seam pitching considerable, and being on the upper side of the road, it crushed him down on the rail. It was of a fire-clay nature, and it always drops without any warning, whenever there is any of it overhanging the sides. There did not appear to be any dangerous roof hanging on the upper side, but there did appear some spall ng of the coals. But this is a common thing in many mines, some seams being much more apt to do so than others, and it is a characteristic of this seam where it is worked here, on plank road, in the Maffit mine, and at Nanticoke. There is much spalling going on even where nothing is done, except driving the gangways and air-ways. Then again, the changes in the temperature produce the same result, more or less, in all mines, and many places have the appearance of a crush, when there is nothing but the disintegration taking place from the change of temperature. Fearing that some small piece should happen to fall, and injure or kill some one else, I gave orders to the mine boss, Mr. William Hasking, to have considerable timbering done there as soon as he could, yet I had no thought of anything more than some small pieces or spalls from the upper side, and this was at once complied with.

The gangway had been driven wide enough to build a stone wall, instead of a wooden brattice, to the lower side from the road, leaving room for the air-current below or between it and the side, which was by far too small as an intake air-way for an extensive part of a mine. This was an experiment adopted during the administration of Mr. H. C. Broadhead, as foreman, and was planned by him, which was found to be expensive, and did not give satisfaction; hence, had been discontinued, the walls being taken down as fast as they could make other arrangements to relieve them. The

gangway was rather larger than the usual run, and especially so where the pitch was heavy. The object of the wall was to change the system of carrying an air-way below or above in the solid coal, but t did not succeed. The wall being vertical, and the roof pitching from twenty-five to forty degrees, or more, the wall could not be of scarcely any support to the roof.

Accident No. 13.—William McLaughlin, a miner, working in the Empire colliery, was fatally injured by piece of coal falling upon him in a cross-cut, on the 13th day of April. I was on my way through the mine, making an inspection of the same, and the mine boss, Mr. L. S. Jones and I were within a very short distance of his chamber, when we were informed of his misfortune, after which we assisted in placing him in an empty car, in which he was taken to the surface. We then examined the place where the accident had occurred, and no one could be blamed in the matter, unless his own judgment was at fault.

Accident No. 16.—L. Synder, a miner, working in the No. 4 slope, Nanticoke, was killed on the 13th day of May, by a fall of top coal, caused through his own reckless action. There was a large piece of top coal, with the fire-clay of eight or ten nches resting upon it hanging across the chamber, and extending back quite a distance, and a very dirty, and what the miners call a very kind slip—a diagonal cleavage on the lower rib side, running through the bottom and top coal.

The said Snyder had fired a blast, and in going under the said top coal, one of his two laborers called his attention to the very dangerous condition of the said top coal, as they are always required to stand temporary props under the top coal until they have sufficient to bring down by a blast, and the miner made a reply to his laborer that it was all right, and chastised him by saying to him thus: "You are like an old woman," and the two laborers began to repair the road, and clean it up after the effects of the blast. The miner commenced to pick out the loose coal around and towards the aforementioned slip, the only little support the top coal had, when suddenly down it came on top of the miner, crushing him into a helpless mass. A case of pure suicide, if there be any such in mining.

Accident No. 20.—B. McGrain, an old and experienced miner, working in No. 9 shaft, Sugar Notch, June the 14th, was instantly killed by a fall of top coal, when just opening a new cha nber, in a place that had the appearance of being perfectly safe. The miner had spent many years at the same mine, and was about seventy years of age.

Accident No. 22.—John Quinn, a miner, working in the Enterprise colliery, on the 20th day of June, was fatally injured by a fall of roof slate, which he was taking down; he and his laborer, both being caught by it. The place had the appearance of a place driven and timbered by competent and experienced hands, the timbers were of large diameter, of good quality, and well set. This case, no doubt, was an accident.

Accident No. 23.—Charles Rannard, a Polish laborer, working in a

chamber in the Mill Creek colliery, on the 20th of June, was fatally injured by a thin piece of rock falling on him, near face of chamber. The piece was a very thin sheet of slate, that broke over and between the timber. This case looked very simple, that is, it looked as if no such results could have happened in a place appearing so safe in general.

ACCIDENT No. 27.—D. R. Thomas, a miner, working in Forty Fort colliery, on the 24th day of July, was instantly killed by a fall of top rock in a chamber. There was very treacherous pieces of rock in this section of the mine, taking some of the nature of fire-clay, and dropping without any warning. Thomas was said to be a good miner, but was a stranger in this colliery, having been there but a short time.

ACCIDENT No. 29.—Dennis Boyle, a laborer, working in gangway in Warrior Run colliery, on the 30th day of July, was killed by a fall of rock. The said slate was hanging back from the face over the car which he was at work loading, and the miner knew the said slate was dangerous. And, in my opinion, had he done his duty in the premises, I believe that the said slate would have been down before it came and killed Boyle. Hence, I think there was great carele sness in this case.

ACCIDENT No. 30.—Andrew Langan, a miner, working in the Empire colliery, on the 2d day of August, was instantly killed by a fall of slate from the roof. The place where this case happened appeared to be a very safe one, but a large piece of slate and a thin layer of bone broke down suddenly across the whole place, and in trying to reach a place of safety, he was caught under the body of it. A purely accidental case, so far as I could judge.

ACCIDENT No. 33.—Thomas Penrose, a miner, and his stepson, Thomas McCormick, working in the Waddell drifts, at the Raubville colliery, on the 11th day of August, were both killed by a fall of slate or fire-clay roof, on the main gangway. They were just opening a new chamber, and had only worked a few days when it occurred. The piece extended for several yards in length, which had one feather edge side, but very heavy on the other. It must have come very suddenly, as they would be sure to have escaped had any warning been given—one being by the powder box, the other not far from him, on the gangway. There is a very dangerous piece of slate over this part of the vein, but it is now being taken down to the rock top, to try and make it more safe in the gangway.

ACCIDENT No. 34.—David Williams, a door-boy, working in the West Nanticoke colliery, on the 13th day of August, was fatally injured by piece of coal falling on him, in the main gangway. He was on the hind end of a loaded car, the topping of which rubbed against the roof, and as the car went by, a small piece of coal dropped from between some cracks or joints between two sets of timber, right upon the said boy, with the above result—a simple, yet clear case of an accident.

ACCIDENT No. 35.—William Cramer, a miner, working in the No. 4 slope, Nanticoke, on the 6th day of September, was killed by a fall of top coal.

This case was pure carelessness on the part of the victim himself, in not putting up temporary timber.

Accident No. 37.—Peter Harlon, a miner, working in the Hartford colliery, on the 25th day of September, was killed by a piece of top coal falling upon him, while preparing tamping to tamp a hole he had ready to charge, having it already bored; had the powder and needle, &c., ready by his side when the said coal fell. It is very likely that it fell upon him at the time a blast in an adjoining chamber was exploded. His partner, or laborer, was down on the gangway loading when it occurred. This appears to have been a purely accidental case.

Accident No. 38.—Evan E. Davis, a fire boss, working in the Oakwood shaft workings, Prospect colliery, on the 27th day of September, was fatally injured by a piece of rock or slate from roof falling upon him. Davis was in the act of removing old wooden brattice, to be again used, the boards and the roof having been known to be very full of slips and breaks, was considered to be too dangerous to remove the said boards by other parties, and the partners of Davis so informed him at the time, and suggested he better let them few boards remain there. He paid no attention, but began to loosen, when a large piece fell, catching him, and injuring him so seriously that he lived but a short time. Another victim to his own folly. He was considered an excellent workman, and perhaps thought he had skill enough to remove the said boards, notwithstanding others feared to do so.

Accident No. 39.—John H. Morgan, a miner, working in No. 2 Tunnel, Nanticoke, drawing back pillars on the 29th day of September, was killed by a fall of top coal, just for the want of a temporary prop. This case again is evidence of the great, and unaccountable carelessness, to which sometimes intelligent and competent miners are often subject. Morgan was intelligent, and competent as a miner, yet he was not sufficiently cautious to guard against ordinary dangers of mining, from which he sacrificed his life.

Accident No. 40.—Condy McGroarty, a miner, working in the Midvale colliery on the 2d day of October, was killed by a fall of fire-clay and bone. He was taking away a small strip of coal from the corner of the pillar, to give more room for the car to pass into his chamber. Had just fired a blast, and returned to find it had not burst out the supposed load. He began picking, when a piece of fire-clay or clod loosened by the said blast fell upon him, crushing him to death instantly. This fire-clay is the same dangerous and treacherous ground as found elsewhere, over the same seam, at Nanticoke and Sugar Notch. This case appeared to have been in a very simple place and manner, yet it could be viewed in no other light than an accident.

Accident No, 41.—J. Poloshofsky, a miner, working in No. 2 Tunnel, Nanticoke, on the 14th day of October, was killed by a fall of top rock, while robbing pillars. The miner, and two others were working together

taking out pillars, when suddenly a very large block of the top rock fell, crushing out a small balance, or piece of a pillar left to support the roof, as well as a few light or small timbers stood in the vicinity by them, and covering and crushing the car and the miner, requiring considerable labor to reach and secure the dead body of the poor man. In my opinion, this case might have been averted, had there been heavier and better, as well as more timber put in this place—the timber would not probably have prevented the rock from falling—but it would have given sufficient warning, to enable the miner to retreat to a place of safety; it was a mere chance that the other two escaped. The said timber should have been put in by the miner, and the mine boss should have seen to it, that such had been done, or stop further work.

ACCIDENT No. 43.—James Higgins, a laborer, working in the Diamond colliery on the 25th day of October, was killed by a fall of top coal, while working in a chamber for a miner named Kennedy. It was stated at the investigation, that the miner claimed that he had cautioned the said laborer not to go to the side of the chamber, where he was crushed from the fall, and yet, the said miner was there with him during all this time, and the unfortunate laborer was in the act of filling his wheelbarrow, to get coal to fill his car. Of course, the miner may say what he likes, the laborer cannot refute his words, as he is silent. But why did the said miner permit him to remain at work there, when he knew the place was so dangerous? Any person examining the place, could see at a glance, that the said coal must have appeared dangerous, as there were large slips in view on both ends of it. I believe the case to have been due to the carelessness of the said miner, and he alone.

ACCIDENT No. 46.—Samuel Hill, a miner, working in No. 2 colliery, Kingston Coal Company, on the 21st day of November, was fatally injured by being struck by a piece of slate, while working in a chamber. Cause, accidental.

ACCIDENT No. 51.—Jac. Boyer, a miner, working in No. 4 colliery, Delaware and Hudson Coal Company, on the 17th day of December, was killed by a fall of top coal. This case was one of those unavoidable ones. His two laborers were slightly injured, but not much the worse. Coal fell from the face, as the miner was sounding it after a blast.

ACCIDENT No. 53.—James Reynolds, a miner, working in the Nottingham colliery, on the 20th day of December, was fatally injured by piece of coal falling upon him, while in the face of his working-chamber, from which injuries he expired the next day. This case was a purely accidental one, unless that the victim himself failed to examine the said piece, as it was immediately in the face or mining portion.

#### By Blasting Powder.

ACCIDENT No. 31.—John Edwards, a miner, aged fifty-eight years, working in the Nottingham colliery, on the 6th day of August, was fatally in-

jured by being burned by the explosion of about one half of a keg of powder, while under his arm. He was handling the powder, when a spark from his lamp ignited the same, with the result above mentioned. This is a sad end to be recorded for a person who had spent probably over half a century in working under ground, and using powder daily to some extent, during which time, no doubt, he had heard or read, if not witnessed, many who had sacrificed their lives or limbs in the careless use and handling of explosives.

Accident No. 52.—John Steel, a miner, working in the Oakwood workings, in Prospect colliery, on the 17th day of December, was fatally injured by being burned from explosion of nearly a full keg of powder, only eighteen inches having been taken out. No one being near him at the time, it must have been ignited from his own lamp. Another life sacrificed through carelessness.

**By Mine Cars.**

Accident No. 1.—Michael Broderick, a miner, working in the Pine Ridge colliery, on the 7th day of January, was fatally injured by car running over him. He was taking out the blocking in front of the car, whereby it started, caught and crushed him, resulting as above stated.

Accident No. 3.—William Stultz, a driver, working in the drift contracted by William Dobson, belonging to the Franklin colliery, on the 14th day of January, was fatally injured by being caught and crushed between a loaded car and the side. No one could have prevented this case unless the young man himself, there being plenty of room on the other side of the track.

Accident No. 11.—James Barrett, a door boy, aged about twelve years, working in the Henry colliery, on the 14th day of April, was killed by cars. He was to attend two doors, and after the trip of empties passed, he closed his door, and, on his way to the second door, he was either on the back end of empty cars, or very close to them, when a trip of three loaded cars came down the road, striking the mule and trip of empty cars, and the boy was found under the car, his head being under the wheel and brains crushed out. His lamp was found lit in the car, which would rather indicate that he was on the rear end of the said car. The car that ran away got away through a failure to sprag of a boy helping the driver, when he, himself, should have done so, and the whole case was the result of the said driver's neglect, but more that of the runner Maloney, who asked him to run and sprag the cars, which he had no business to do. He delegated the work of spragging to a boy not competent to do so, and then gave orders for him to start the cars before he had got to a place to get sprags, on the run, that he could have had some more to put in, so that the driver failed to sprag, not being accustomed, and he failed because the cars came after him too soon, when he could not sprag. A case altogether of carelessness. The discipline prevailing in the colliery does not check the matter of carelessness amongst the boys as much as it should, in my opinion.

ACCIDENT No. 14.—Frank Miller, a door boy, fourteen years old, working in Audenried colliery, on the 25th day of April, was killed by a car running away and striking an empty car, which was thrown from the track and crushed the said boy between it and the side. He was away from his door when the case occurred, and it could not have happened him had he remained at his station. This, however, appears to be a difficult task to have accomplished.

ACCIDENT No. 17.—John Schumaker, a laborer, working for his father in a gangway, in the Henry colliery, on the 20th day of May, was fatally injured by a car running over him on a self-acting plane. The young man happened to be at head of plane, where the empty car failed to land, it being a new plane, just getting it into operation, and he good naturedly turned and gave the party working there his assistance to get the car to its proper place, when, by some means the car got loose from the rope and ran back, carrying the young man with it quite a distance down the plane, and injuring him so seriously that he died of his injuries within a day or two.

ACCIDENT No. 19.—James Keeny, a laborer, working at foot of slope in Empire colliery, on the 11th day of June, had his leg crushed between loaded cars. He was sent to the city hospital, and in a length of time saw it reported that he had died, and presume it was from results of said accident.

ACCIDENT No. 21.—West Everett, a boy, working at Laurel Run colliery, on the 17th day of June, was fatally injured, by being run over by a car on the culm dump. He had no business on or near said car; hence, had not that danger to encounter, but, like many other boys, ran the risk, and reaped a sad result.

ACCIDENT No. 25.—John O'Brien, a door-boy, working in the No. 5, Delaware and Hudson Coal Company, on the 24th day of July, was killed by a loaded car, which had run away from the gangway at the head of the grade or run. The boy was near the foot of the run, with the driver, when the runaway car came down, and struck the trip, and killing the mule and the boy at the same time. The driver had given the gangway miner and laborer orders to run the car out when loaded, and they did; and the car ran further than they had intended it should, with the above result. They, the miner and laborer, were discharged for having started the car, as it was not their business; also the runner and driver were discharged.

ACCIDENT No. 26.—C. G. Case, a stable boss at the Dodson colliery, on the 25th day of July, was killed by being run over by a loaded car, on the branch near foot of shaft. Mr. Case had not long been down from the surface, and was passing along the road towards the stable where they kept the mule, when he moved from off the one track on to another, as he supposed, out of the way of a trip of empty cars, when he was struck by the loaded car just being run from foot of plane. The boy attending foot claimed he called to him to leave the track, but it appears he was confused, or he did not hear the alarm, as there was ample room between the tracks, a space of four to six feet.

Accident No. 32.—Elias Williams, a laborer, at work at top of self-acting incline plane, in the Lance colliery, on the 9th day of August, was killed by loaded car jumping off the track, and crushing him against the bottom, under the bumper. The car was on a curve, and, although moving slowly, mounted the rail on the outside of the said curve, just where he was stationed with a sprag to stop the same before getting to plane head; a simple, yet an accidental, case.

Accident No. 42.—J. Conahan, a driver-boy, aged fourteen years, working in the Nottingham colliery, on the 25th day of October, was fatally injured by being run over by a trip of loaded cars, which he had just unhitched from his mule, and running ahead to sprag, forgot to turn his latches. The cars, as a matter of course, followed the road on which he did not expect them, as he there bent down or stooped, preparatory, to sprag the same, when, instead, they ran on the track he was on, and fatally injured him, from which he died the following day.

Accident No. 45.—Martin Williams, a laborer, working in a chamber in the Exeter colliery, on the 13th day of November, was killed by a trip of two empty cars running upon him in the chamber in which he was at work. The accident was a very strange one, as the miner and a young man, laboring in the adjoining chamber, were within a few feet of him when it occurred, and, strange to say, did not see him fall, but had seen him a few seconds prior and immediately after he fell. The cars had been left to run down an inclination, and by their own momentum were to and did ascend a slight pitch to the face of the chamber, where the said three men were waiting to sprag and block the same, but Williams fell just as they reached him, with the above result—mysteriously.

Accident No. 47.—Robert V. Thomas, a carpenter, working at the Red Ash Coal Company's colliery, on the 2d day of December, was fatally injured by being caught and crushed between a loaded car and the side on the slope. Mr. Thomas was a very excellent mechanic, having, within the last ten years, erected numerous private residences and church edifices, and had entered into the business of undertaker, both here and at Kingston; but one of his last jobs was the erection of the coal breaker at this colliery, and was then doing some extra jobs inside the mines, when, by some oversight or thoughtlessness on his part, he stood in a narrow spot on the slope, with the intention of letting the car pass, notwithstanding that his own son and others had warned him against doing so. When he saw the car was approaching him he moved to get away, but did so too late, and was caught and crushed, with the above sad result. There was a space of four or five feet between the car and the side just opposite from where he was caught. It all happened in open day-light, as the slope is only about twenty-five yards long.

Accident No. 48.—Rodger Munley, a door-boy, aged fifteen years, working in the Hollenback shaft, on the 4th day of December, was instantly killed by a car running over him. He attended a door near the foot of a

run in the second opening being driven there, and the runner having gone up the run, he had to call out when he should run down the car. He did so, and the car came down; the boy, for some reason, failed to open his door in time, and the car struck it just as he was opening it, whereby the boy was struck, and found under the car—his skull having been crushed in—and died in a few moments.

ACCIDENT No. 49.—Edward Killgallon, a driver-boy, working in the Wyoming colliery, on the 6th day of December, was killed by being caught and crushed between an empty car and the side. It appeared that the mule he drove was rather fractious, and, at a point on the route, turned out into the mouth of an old opening, and in doing so pulled the car off the track, and the boy, being on the front end of the car, was jammed between the car and the side, with the above result.

**Miscellaneous.**

ACCIDENT No. 5.—Michael Murphy, a miner, working in No. 10 slope, Sugar Notch colliery, on the 7th day of February, was instantly killed by the explosion of his own blast. He had attempted to fire the said blast several times, and had returned again, expecting it had missed fire, but just as he got close to it, the same went off, with the above result.

ACCIDENT No. 24.—David Williams, working in No. 2 colliery, Kingston Coal Company, on the 18th day of July, was fatally injured by flying coals from a blast fired in the adjoining chamber, and died on the 31st of the same month.

ACCIDENT No. 28.—John Gibbons, a laborer, working in the Hutchison colliery, on the 25th day of July, was killed by a blast. The party firing the blast gave the usual warning, and ran away to a place of safety. Gibbons, after knowing this, attempted to run by the place when the blast was about to explode, but just as he reached the center of the chamber mouth—being a new one—the blast exploded, with the above result, almost a perfect suicide.

ACCIDENT No. 54.—Thomas Gaharty, a laborer, working at the foot of shaft in the Henry colliery, on the 23d day of December, was fatally injured by being scalded. He had been employed, but temporarily, in the absence of the regular footman, but had worked at the same job at times before. This day he had just helped to push the empty car from off the carriage towards the empty track, and in returning—in a moment of absent-mindedness—apparently he walked back on the same track, as he had pushed away the empty car, and the carriage having been signaled by the engineer to be required to be sent up empty, it had been taken away, and he stepped right into the sump. His partner gave the alarm, hearing a noise in the sump, to stop the carriage, which was descending, and he was taken out terribly scalded. The carriage had been signaled for when he stood at the bell wire-handle himself, and then again he should have turned to the right on the spare track to have passed the shaft-foot even if going to put on a loaded car. There was some difficulty about his lamp not giving light a

moment or so before, yet there should have been sufficient light there from a large night-hawk lamp, suspended near there to light the foot; besides that, day light is quite strong there at the immediate foot. The water was not very deep, but the two steam pumps having exhausted into the water all night, it was very hot, and there was no way to cover the sump over, as there is a long piece of the carriage below the platform on which the car rests, being one of the self-dump kind. This was one of the most strange or singular accidents that occurred during the year.

**On Surface.**

Accident No. 10.—W. Johnson, a boy oiler, employed in the breaker at the Midvale colliery, on the 10th day of April, was killed by having been caught in the moving machinery—the wheel or shaft to rollers—while oiling the same. It was thought that his clothing was caught by the wheel, whereby he was pulled into direct contact with the same, and fearfully mangled.

Accident No. 36.—Thomas Leonard, a boy, working inside the mine in the No. 3 Baltimore colliery, on the 24th day of September, was killed by a mule. The boy had finished his day's work, and volunteered to take the said mule to the barn, only a few yards away. But in going the mule threw him off, when his foot became fast in the harness, and this caused the mule to become frightened, and he ran a half mile or more with the boy dangling around him, and the boy was dead when found.

In addition to the regular tabulated accidents, the following cases should be mentioned, as follows, to wit:

Pine Ridge Colliery.—Mr. John Laidler, an old an experienced miner, was found dead, supposed from heart disease, in his working-place, November 15.

Enterprise Colliery.—Mr. Thomas Gallagher, a miner, died in his working-place, supposed case of heart disease, March 10, 1879.

Maltby Colliery.—Mr. Thomas Cockburn, a miner, took cramps in the stomach, and died before he could be taken out of the mine, leaving a family of a wife and eight children.

Nottingham Colliery.—A corpse of a human body was found in the above mine, in an old part, in a state of decomposition and decay, so much so that it was beyond recognition. An inquest was held, but no clue as to whom he could be, or how he came to the place where he was found. The spot where he was found was very difficult of access, being in a part of the mine abandoned for some time previous. Some people thought he might have straggled there, and failed to get relief, or come away; others thought he might have been taken there after being foully dealt with, to escape detection; some think he was an insane man, missing from the neighborhood of Avondale, &c., &c.

In my accident list of 1878, by an oversight I omitted the name of a miner, Patrick Moore, killed in the Franklin colliery that year, by a fall of coal. Cause, purely accidental.

**TABLE No. 9.**—*List of collieries, names, and location, with*

| NAME OF COLLIERY. | Location of Colliery. | Name of Operator. | Name of General Superintendent. |
|---|---|---|---|
| Mocanaqua, | Shickshinny, | Mocanaqua Coal Company, | |
| Salem, | do. | Salem Coal Company, | J. H. Harman, |
| No. 1 slope, | East Nanticoke, | Susquehanna Coal Company, | Joseph Stickney, |
| Nos. 1 and 2 tunnels, | do. | do. do. | do. |
| Nos. 2 and 4 slopes, | do. | do. do. | do. |
| No. 4 tunnel, | do. | do. do. | do. |
| No. 1 shaft, | do. | do. do. | do. |
| No. 2 shaft, | do. | do. do. | do. |
| No. 3 slope, | West Nanticoke, | do. do. | do. |
| No. 3 tunnel, | do. | do. do. | do. |
| Warrior Run, | Warrior Run, | A. J. Davis & Co., | A. J. Davis, |
| Franklin, | Near Ashley, | Franklin Coal Company, | R. R. Morgan, |
| Hillman, | Plains township, | H. Baker Hillman, | H. B. Hillman, |
| Maltby, | Near Wyoming, | C. S. Maltby, | O. A. Fowler, |
| Hutchison, | Near Kingston, | Charles Hutchison, | J. C. Hutchison, |
| ast Boston, | do. | William G. Payne & Co., | W. G. Payne, |
| No. 1 shaft, | do. | Kingston Coal Company, | Daniel Edwards, |
| No. 2 shaft, | do. | do. do. | do. |
| Gaylord colliery, | Near Plymouth, | Gaylord Coal Company, | do. |
| Dodson, | do. | Plymouth Coal Company, | E. F. Stevens, |
| Chauncey, | do. | McFarland, Cooper & Co., | Thomas McFarland |
| Ellenwold shaft, | Near Kingston, | Albright, Dickson & Co., | James P. Dickson, |
| Boston, | do. | Dela. Lack. and West. R. R. Co. | W. R. Storrs, |
| Avondale, | do. | do. do. | do. |
| Jersey, | do. | do. do. | do. |
| Hollenback, | Plains township, | R. S. Pool, | R. S. Pool, |
| Enterprise, | do. | H. C. Roberts & Co., | C. D. Simpson, |
| Forty Foot, | Near Wyoming, | J. H. Swoyer, | F. M. Shoemaker, |
| Wyoming, | Plains township, | do. | |
| Henry, | do. | Lehigh Valley Coal Company, | Frederick Mercur, |
| Midvale, | do. | do. do. | do. |
| Mineral Spring, | do. | do. do. | do. |
| Prospect, | do. | do. do. | do. |
| Exeter, | Exeter township, | do. do. | do. |
| Mill Creek, | Plains township, | Delaware and Hudson Canal Co., | A. H. Vandling, |
| Pine Ridge, | do. | do. do. do. | do. |
| Laurel Run, | do. | do. do. do. | do. |
| Baltimore slope, | do. | do. do. do. | do. |
| Young's slope, | do. | do. do. do. | do. |
| Baltimore tunnel, | do. | do. do. do. | do. |
| Conyngham shaft, | do. | do. do. do. | do. |
| No. 1 shaft, | Near Plymouth, | do. do. do. | do. |
| No. 2 shaft, | do. | do. do. do. | do. |
| No. 3 shaft, | do. | do. do. do. | do. |
| No. 4 shaft, | do. | do. do. do. | do. |
| No. 5 shaft, | do. | do. do. do. | do. |
| Nos. 1 and 2 Wanamie, | Wanamie, | Lehigh and Wilkes-Barre Coal Co | George H. Parrish, |
| Espy, | Hanover township, | do. do. do. | do. |
| Sugar Notch shaft, | Sugar Notch borough, | do. do. do. | do. |
| Sugar Notch slope, | do. do. | do. do. do. | do. |
| Hartford, | Near Ashley, | do. do. do. | do. |
| Jersey, No. 2, | do. | do. do. do. | do. |
| Audenried, | Near Wilkes-Barre, | do. do. do. | do. |
| No. 2 Empire shaft, | do. | do. do. do. | do. |
| Empire shaft, | do. | do. do. do. | do. |
| Hollenback slope, | do. | do. do. do. | do. |
| Diamond, | do. | do. do. do. | do. |
| Hollenback shaft, | do. | do. do. do. | do. |
| Lance, | Plymouth, | do. do. do. | do. |
| Washington colliery, | Near Plymouth, | do. do. do. | do. |
| Nottingham, | Near Plymouth, | do. do. do. | do. |
| Waddell's drifts, | Near Mill Hollow, | Waddell & T. F. Walters, | do. |
| Red Ash colliery, | Wilkes-Barre twp., | M. B. Williams, Parrish & Co., | M. B. Williams, |

*names of principal officers, in the Wilkes-Barre district, for 1879.*

| Name of Assistant Superintendent. | Name of General Outside Foreman. | Name of Inside Foreman. | Name of Mine Boss. | Name of Outside Foreman. |
|---|---|---|---|---|
| . . . . . | . . . . . | . . . . . | . . . . . | Not in operation. |
| . . . . . | . . . . . | . . . . . | . . . . . | G. Kreiger, |
| Geo. T. Morgan, | Geo. T. Morgan, | Thos. R. Williams, | Timothy Downing, | George Hopkins. |
| do. | do. | do. | George Feltmeyer, | do. |
| do. | do. | do. | David W. Evans, | do. |
| do. | do. | do. | Samuel Wilson, | do. |
| do. | do. | do. | James Turner, | do. |
| do. | do. | do. | . . . . . | do. |
| do. | do. | do. | . . . . . | Idle. |
| do. | do. | do. | Worthy Carver, | J. W. McFarland. |
| . . . . . | Jas. E. Roderick, | Jas. E. Roderick, | John C. Jones, | Robert F. Lloyd. |
| . . . . . | William Thomas, | William Thomas, | John Hughes, / Samuel Thomas, | Charles Farren. |
| . . . . . | . . . . . | . . . . . | George Faurick, | George H. Hillman. |
| . . . . . | . . . . . | Thomas Lawther, | George Smith, / John Morris, | A. B. Tyrrell. |
| . . . . . | . . . . . | . . . . . | J. L. Crawford, | Frank P. Kimble. |
| . . . . . | E. F. Payne, | . . . . . | John Parry, | E. F. Payne. |
| . . . . . | . . . . . | M. D. Rosser, | Daniel R. Davis, | Thomas L. Morgan. |
| . . . . . | . . . . . | do. | Daniel Lewis, | Morgan D. Rosser. |
| . . . . . | . . . . . | . . . . . | George Picton, | David Isaac. |
| . . . . . | E. F. Stevens, | Michael Shonk, | Michael Shonk, | E. F. Stevens. |
| . . . . . | . . . . . | . . . . . | A. Weir, | Thomas McFarland. |
| . . . . . | . . . . . | James Tretheway, | James Tretheway. | |
| . . . . . | . . . . . | B. Hughes, | Henry P. Davis, | Robert Hutchison. |
| . . . . . | . . . . . | do. | Thomas J. Phillips, | Conrad Lee. |
| . . . . . | . . . . . | do. | . . . . . | Not in operation. |
| . . . . . | . . . . . | . . . . . | Henry James, | M. Mickels. |
| . . . . . | Wm. McCulloch, | Wm. McCulloch, | Robert Hislop, | John Enstice. |
| . . . . . | do. | do. | Philip McCabe, | J. D. Patton. |
| . . . . . | . . . . . | do. | J. B. Jones, | Philip Wintersteen. |
| . . . . . | . . . . . | . . . . . | Thomas E. Lewis, | William E. Lines. |
| . . . . . | . . . . . | . . . . . | Richard Martin, | W. Patton. |
| . . . . . | . . . . . | . . . . . | John Shoemaker, | John Colvin. |
| . . . . . | . . . . . | . . . . . | William Samuel, | William Patten. |
| . . . . . | . . . . . | . . . . . | Abednigo Reese, | A. G. Mason. |
| . . . . . | . . . . . | . . . . . | John E. Cook, | William Foot. |
| Christ. H. Scharar, | — Chittenden, | C. H. Scharar, | John T. Moore, | W. A. Gustin. |
| do. | do. | do. | Hugh McDonald, | D. W. Kemble. |
| do. | do. | do. | Thomas Tamblyn, | John Bowers. |
| do. | do. | do. | . . . . . | Not in operation. |
| do. | do. | do. | William W. Reese, | Ed. Mackin. |
| do. | do. | do. | do. | |
| do. | E. R. Peckins, | do. | . . . . . | Not in operation. |
| do. | do. | do. | William Coblcy, | E. R. Peckin. |
| do. | do. | do. | . . . . . | Not in operation. |
| do. | do. | do. | Ed. Hahn, | Charles Lawson. |
| do. | do. | do. | Caleb Shonk, | A. Schnell. |
| F. B. Parrish, | William T. Leas, | William T. Smith, | Nicholas Rapson, | Robert O. Leas. |
| do. | . . . . | do. | . . . . . | Breaker burnt down. |
| do. | H. C. Brodhead, | do. | Thos. W. Morgan, | L. G. Klntzer. |
| do. | do. | do. | William Hosking, | D. C. Tiffany. |
| do. | F. B. Parrish, | do. | D. R. Roberts, | Merrit Frederick. |
| do. | do. | do. | . . . . . | Not in operation. |
| do. | do. | do. | M. R. Morgans, | Thomas Wagner. |
| do. | do. | do. | . . . . . | Not in operation. |
| do. | do. | do. | L. S. Jones, | Thomas Williamson. |
| do. | do. | do. | . . . . . | Not in operation. |
| do. | do. | do. | David Jonathan, | Thomas Conner. |
| do. | do. | do. | Joseph Weir, | William L. Stewart. |
| do. | F. E. Tiffany, | do. | Daniel Reese, | James Linn. |
| do. | do. | do. | D. W. Evans, | P. H. Garahan. |
| do. | do. | do. | J. B. Davis, | George R. Conner. |
| . . . . . | James Waddell, | . . . . . | Thomas Waddell, | George Waddell. |
| . . . . . | . . . . . | M. B. Williams, | M. B. Williams, | Wolf Reisler. |

TABLE No. 10.—Colliery Accidents not proving fatal, during 1879, in the Wilkes-Barre District.

| DATE. | No. of accident. | NAME AND LOCATION OF COLLIERY. | NAME OF INJURED. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|
| Jan. 8 | 1 | Henry colliery, | Henry Morris, | Caught between door and car, and injured quite severely, internally. |
| 8 | 2 | Sugar Notch, No. 10, | Thomas Prisk, | Slightly injured by explosion of gas. |
| 19 | 3 | Empire colliery, | William Howell, | Collar-bone fractured ; fell while in the act of putting up a long prop. |
| 20 | 4 | Mill Creek colliery, | William Rowley, | Slightly injured on side of face, and one arm, by explosion of gas. |
| 21 | 5 | No. 5, Delaware and Hudson colliery, | Joseph Badman, | Leg broken by a blast, which ignited as he returned to the hole to re-touch. |
| 21 | 6 | No. 2 tunnel, Naticoke, | Thomas Buckland, | Injured, not seriously, by a piece of slate falling on him. |
| 23 | 7 | Empire breaker, | John Georgu, | Arm broken by coupling cars. |
| 28 | 8 | Hollenback colliery, | Martin Murphy, | Injured by prop falling on him, but not seriously. |
| 28 | 9 | Hutchison colliery, | Draper Petly, | Leg broken, by a blast exploding, just as he had returned to re-touch. |
| 28 | 10 | Exeter colliery, | John Newton, | Burned slightly on face, but severely on hands, by explosion of gas. |
| 29 | 11 | Prospect colliery, | John Clark, | Leg broken, and otherwise severely injured by falling under cars. |
| 30 | 12 | Exeter colliery, | John Faringer, | Arm severely injured at breaker, while coupling cars. |
| Feb. 8 | 13 | Mill Creek colliery, | Reuben Edwards, | Arm, and one finger injured by car running on them. |
| 10 | 14 | Wanamie colliery, | James Keeny, | Injured on body by fall of rock. |
| 12 | 15 | Henry colliery, | A. Gallagher, | Burned quite severely on back, arms, and face, by explosion of gas. |
| 13 | 16 | No. 2, Nanticoke colliery, | Albert Learch, | Seriously injured, by locomotive striking him. |
| 17 | 17 | Prospect colliery, | James Haley, | Face, arms, and hands slightly burned, by explosion of gas in his chamber. |
| 19 | 18 | Sugar Notch No. 10, breaker, | Frank Slick, | Bruised ; caught between cars outside, at head of slope. |
| 20 | 19 | Washington colliery, | William D. Evans, | Internally injured ; caught between car and door. |
| 20 | 20 | Sugar Notch No. 10, colliery, | Mark Evans, | Injured severely on hip and back, by a piece of fire-clay falling on him. |
| 25 | 21 | No. 4 shaft, Delaware and Hudson Coal Co., near Plymouth, | Patrick Monahan, Ed. Gatous, | Both slightly injured by the explosion of a cartridge they were tamping, when it exploded. |
| 27 | 22 | No. 10 slope, Sugar Notch, | John Shay, | Leg broken ; car got off track, and caught his leg. |
| March 1 | 23 | Nottingham colliery, | Patrick Meighan, | Arm cut off, being caught between car and side ; he was driving. |
| 4 | 24 | Pine Ridge colliery, | Josiah Eddy, | One hand, and leg badly bruised and cut, by premature explosion of a blast. |
| 10 | 25 | Pine Ridge colliery, | John Kaytes, | Leg broken by car running down slope, he being in said car against the law. |
| 12 | 26 | No. 2, Delaware and Hudson colliery, | Ed. Kinney, | Injured, not seriously, by fall of roof, same time that his miner, Thomas Ruthford, was killed. |
| 14 | 27 | Prospect colliery, | Lawrence Dempsy, | Injured by a blast, ignited from a feeder of gas, prematurely. |
| 15 | 28 | Sugar Notch No. 10, | Peter Munson. Benjamin Munson. | Both burned severely on faces and hands, by explosion of gas ; neglected to put brattice up after breaking it down. |
| 17 | 29 | Empire colliery, | William May, | Leg broken by fall of coal. |
| 18 | 30 | No. 10, Sugar Notch, | James Hammel, | Face and hands burned by explosion of gas. |
| 20 | 31 | Empire colliery, | A. Morgan, | Leg broken ; caught between car and side or brattice. |
| 21 | 32 | Prospect colliery, | John Fitzpatrick, | Kicked by a mule, very seriously on the head, until brains protruded from wound. |
| 28 | 33 | Laurel Run colliery, | P. McCarty, | Injured seriously by a fall of rock. |
| 31 | 34 | Midvale colliery, | A. Ernest, | Injured on leg by cars. |
| April 5 | 35 | Midvale colliery, | Robert Gardner, | Arm severely injured, and body some, by falling under cars. |

| | | | | | |
|---|---|---|---|---|---|
| | 4 | 36 | Prospect colliery, | John Ward, | Hand severely injured by cars running over it. |
| | 7 | 37 | Midvale colliery, | Hugh Rogan, | Leg and back injured, by piece of rock falling on him. |
| | 8 | 38 | Prospect colliery, | David E. Morris, | Injured by blast exploding prematurely. |
| | 8 | 39 | Midvale, colliery, | James Nicholl, | Slightly injured on arm, by fall of piece of rock. |
| | 11 | 40 | Henry colliery, | Neil Brogan, | Severely injured by a blast, which he had returned to re-touch. |
| | 15 | 41 | Sugar Notch colliery, | J. Lawler, | Injured on back, by fall of roof. |
| | 21 | 42 | Pine Ridge colliery, | John Gratton, | Head and leg injured by fall of coal. |
| | 19 | 43 | Lance colliery, | Daniel Davis, | Hips and back injured by runaway car. |
| | 22 | 44 | No. 4 slope, Nanticoke, | James Marker, | Both slightly injured by explosion of gas in cross-cut. |
| | | | | B. D. Jones. | |
| | 24 | 45 | Prospect colliery, | Hugh Trainor, | Both badly burned from explosion of gas in chamber. |
| | | | | John Muloney. | |
| | 24 | 46 | No. 2 colliery, Nanticoke, | George O. Bitz, | Seriously injured; thrown from a mule, and foot caught in harness, and dragged a distance. |
| | 28 | 47 | Exeter colliery, | M. J. Welsh, | Injured on arm and head, by explosion of blast; he had just returned to re-touch, as he supposed. |
| | 20 | 48 | Prospect colliery, | Louis Knot, | Burned slightly by explosion of gas. |
| April | 30 | 49 | Pine Ridge colliery, | Martin Hogan, | Arm cut off and hip dislocated; run over by loaded car. |
| May | 1 | 50 | Exeter colliery, | Evan Thomas, | Injured on shoulder and back slightly: fall of rider coal. |
| | 2 | 51 | Prospect colliery, | Martin Conway, | Head and back injured by piece of rock. |
| | 2 | 52 | Prospect colliery, | Michael Mangan, | Several teeth kicked out by a mule. |
| | 3 | 53 | Nottingham colliery, | William E. Williams, | Back severely injured; run over by car. |
| | 5 | 54 | No. 4, Delaware and Hudson colliery, | Thomas O. Keif, | Hip dislocated; piece of coal fell on him. |
| | 5 | 55 | Prospect colliery, | James Flood, | Face and hands burned severely by explosion of gas in chamber. |
| | 6 | 56 | Audenried colliery, | Levi Gibbons, | Both seriously burned on faces and bodies by gas, at same time and place that six |
| | | | | John Richards. | others were fatally burned, including William Smith and others. |
| | 7 | 57 | Exeter colliery, | Michael Sumen, | Burned in face and hands slightly by gas explosion, through his own carelessness, in entering a vacant place. |
| | 8 | 58 | No. 1 shaft, Nanticoke, | Ed. Frazer, | Slightly burned by explosion of gas. |
| | 8 | 59 | Henry colliery, | Anthony Duffy, | Both very slightly burned by explosion of gas in a new chamber. |
| | | | | Joseph Cambell. | |
| | 10 | 60 | No. 2 tunnel, Nanticoke, | T. R. Thomas, | Severely cut by fall of top coal. |
| | 10 | 61 | No. 2 colliery, Kingston Coal Co., | John Prosser, | Injured severely by blast exploding prematurely. |
| | 14 | 62 | Exeter colliery, | Stephen Cairns, | Burned severely on face and arms by explosion of gas in chamber. |
| | 17 | 63 | Hartford colliery, | Frederick Scoter, | Burned seriously by gas explosion, through carelessness of himself and miner, in going into another place, one thousand five hundred feet from working place. |
| | 21 | 64 | No. 3, Baltimore slope, | Jacob Wasle, | Leg broken in two places, by piece of coal rolling on it. |
| | 21 | 65 | No. 4, Delaware and Hudson colliery, | Ed. Hefferen, | Leg broken by fall of piece of coal on it, while visiting his adjoining place. |
| | 22 | 66 | Mill Creek colliery, | George Forcey, | Burned very slightly on face and elbow, by explosion of gas in his chamber. |
| | 27 | 67 | Mill Creek colliery, | Ed. Ayres, | Ayres had face and leg, and Maston hand, severely injured by piece of roof falling on |
| | | | | C. Maston. | them. |
| | 28 | 68 | Wyoming colliery, | John Frahil, | Frahil and Evans very seriously burned on faces and hands, by explosion of gas; |
| | | | | Thomas J. Evans. | caused same manner and place that Samuel Davis was fatally injured. |
| June | — | 69 | Enterprise colliery, | Henry Walters, | Had four fingers cut off by piece of rock falling on him. |
| | 6 | 70 | Washington colliery, | Thomas Stephens, | Leg broken by explosion of blast; failed to get away in time. |
| | 9 | 71 | Washington colliery, | C. D. Kocker, | Two ribs broken; fell from empty car. |
| | 11 | 72 | Empire colliery, | John Williams, | Leg broken, at shaft foot, by some misunderstanding between himself and engineer, in letting down timber, &c. |
| | 11 | 73 | Lance colliery, | William Thompson, | Seriously injured; being crushed between car and side, or rib, at shaft foot. |
| | 13 | 74 | No. 4, Delaware and Hudson colliery, | Barney Brogan, | Foot severely injured; car run over it. |
| | 16 | 75 | No. 2, Delaware and Hudson colliery, | Henry Jones, | Leg severely injured; car run over it. |
| | 18 | 76 | Empire colliery, | William Herrigan, | Injured on head quite severely by explosion of blast, which he had returned to retouch. |

TABLE No. 10.—Colliery Accidents not proving fatal—Continued.

| DATE. | No. of accident. | NAME AND LOCATION OF COLLIERY. | NAME OF INJURED. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|
| June 18 | 77 | Enterprise colliery, | Thomas Hooper, | Both injured by falling roof, while taking it down, but not very seriously. |
| | | | John Masman. | |
| 20 | 78 | Franklin colliery, | James Ruddy, | Fell under car; arm broken in two places. |
| 21 | 79 | Pine Ridge colliery, | William O'Gulre, | Burued slightly by gas explosion, and leg bruised by falling in chamber. |
| 23 | 80 | Hillman's colliery, | Martin Vanvey, | Injured; leg broken by fall of coal. |
| 23 | 81 | Empire colliery, | L. S. Jones, | Jones, a mine boss, and Haycock, a fire boss, were severely injured by piece of roof |
| | | | John Haycock. | falling on them, while traveling together on gangway. |
| 25 | 82 | No. 2 shaft, Nanticoke, | Thomas A. Jones, | Slightly burned by gas explosion in a cross-cut. |
| 26 | 83 | Exeter colliery, | William Nicholson, | Leg injured; crushed between cars. |
| 26 | 84 | Empire colliery, | John W. Roberts, | Leg broken by fall of coal. |
| 26 | 85 | Franklin colliery, | John Gitten, | Face and hand burned by explosion of cartridge of powder, from spark falling into it from his lamp. |
| 26 | 86 | Prospect colliery, | L. Dempsey, | Leg or foot considerably bruised; caught between car and door frame. |
| 27 | 87 | Empire colliery, | Jacob Kline, | Shoulder blade broken by prop falling on him. |
| 30 | 88 | No. 2 colliery, Kingston Coal Co., | Patrick McHale, | Leg broken by piece of coal falling on him in chamber. |
| 28 | 89 | Midvale colliery, | James Wilson, | Injured severely on face and body by cars falling to open door in time. |
| July 2 | 90 | Hartford colliery, | Samuel Mathews, | Leg broken by piece of coal falling on it while drilling. |
| 7 | 91 | Hollenback colliery, | M. Dolan, | Both burned severely by explosion of gas, caused by fan-belt slipping, reducing speed |
| | | | Gus. Baker, | of same, &c. |
| 7 | 92 | Prospect colliery, | Jabez Phillps, | Injured by kick from a mule. |
| 9 | 93 | Diamond colliery, | Enoch Aston, | Arm broken, and otherwise injured, caught between cars and side. |
| 10 | 94 | No. 1, Baltimore colliery, | Daniel Evans, | Received severe flesh wound on leg, no bones broken; caused by chain breaking on plane. |
| 11 | 95 | Enterprise colliery, | Thomas Dixon, | Injured by fall of top coal. |
| 12 | 96 | Laurel Run colliery, | John Smith, | Burned seriously by explosion of powder, nearly a half keg; all pure carelessness. |
| 12 | 97 | Boston colliery, | James Williams, | Leg broken by car running over it while attempting to get on. |
| 19 | 98 | Diamond colliery, | George Hauk, | Hand and fingers injured by car. |
| 23 | 99 | Mill Creek colliery, | Thomas White, | Injured severely by explosion of a blast; took hold of straw in barrel, and blast exploded. |
| 26 | 100 | Empire colliery, | Richard Morris, | Severe flesh wound on leg, by car running over him. |
| 25 | 101 | Hartford colliery, | John Lydon, | Leg broken by piece of coal falling on it. |
| 26 | 102 | Franklin colliery, | Conrad Shindle, | Injured by piece of timber falling on him. |
| August 1 | 103 | Mineral Spring colliery, | David Roberts, | Injured slightly on foot by car on culm bank. |
| 1 | 104 | No. 3, Baltimore colliery, | Thomas J. Davis, | Injured severely by blast; used patent oil to make match. |
| 2 | 104 | Exeter colliery, | Thomas Hughes, | Hurt by coals from a blast which was fired by miner named S. Curley, working next place, without warning. |
| 5 | 105 | Diamond colliery, | Frank Kreig, | Injured on face by coals from a blast. |

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| | 5 | 106 | No. 2 tunnel, Nanticoke, | George Kowler, | Slightly hurt by explosion of blast; going back to re-touch, as he supposed it had missed fire. |
| | 6 | 107 | Nottingham colliery, | John Smith, | Slightly burned on face by explosion of half keg of powder by his miner, John Edwards, who was fatally injured through his own carelessness. |
| | 7 | 108 | Prospect colliery, | James Mullen, | Leg broken, being caught between car and side or prop. |
| | 6 | 109 | Dodson colliery, | Thomas Wyley, | Burned slightly by powder; exploded cartridge as he took it from hole. |
| | 7 | 110 | No. 9 shaft, Sugar Notch colliery, | William Parry, | Severely burned on face and hands by gas explosion; entered his place against rules, heedless of danger mark, &c. |
| | 8 | 111 | Prospect colliery, | John Bevan,<br>John Welsh, Jas. Fox. | Bevan, Welsh, and Fox were all three very slightly burned on hands, and Bevan a trifle on one side of face, while taking down brattice carelessly. |
| | 11 | 112 | Wyoming colliery, | John S. Jones, | Injured by blast; returned to shot, thought it had missed fire, when it exploded; sight probably lost. |
| | 11 | 113 | Wyoming colliery, | W. H. Dove,<br>John Geesey. | Both burned severely by explosion of gas, rather mysteriously, in working places. |
| | 12 | 114 | Nottingham colliery, | James Kelly, | Injured severely by piece of coal flying from solid face. |
| | 18 | 115 | Red Ash colliery, | M. Vanhart, | Leg broken by fall of coal. |
| | 20 | 116 | Waddell colliery, | James McGee, | Injured by blast from adjoining chamber; did not hear warning. |
| | 25 | 117 | No. 1 slope, Nanticoke, | Tim. Downing, | A mine boss, severely burned on face and hands by explosion of gas. |
| | 26 | 118 | Mineral Spring colliery, | Lawrence Luby, | Injured by blast; cut match too short. |
| | 29 | 119 | Enterprise colliery, | Thomas Cavanaugh, | Injured on side; one rib broken, being caught between two cars. |
| Sept. | 5 | 120 | Diamond colliery, | William H. Richards, | Severely cut on head and face, by fall of slate. |
| | 5 | 121 | Mineral Spring colliery, | David Davis, | Injured on leg; small bone fractured by light cars running over him. |
| | 6 | 122 | Chauncey colliery, | Harry Williams, | Cut severely on head, by premature blast. |
| | 6 | 123 | Franklin colliery, | John McGlyn, | Injured on thigh and inwardly, by piece of slate striking him. |
| | 8 | 124 | Mill Creek colliery, | G. B. Robinson, | Leg broken, by fall of piece of rock on it. |
| | 8 | 125 | Hartford colliery, | Robert H. Owens, | Head and back severely hurt, by timbering. |
| | 8 | 126 | No. 4 slope, Nanticoke, | Thomas Gibbons, | Leg broken while timbering; one of the pieces fell on it, with above result. |
| | 9 | 127 | Mill Creek colliery, | John Forcey, | Leg broken by falling in front of truck, which ran over him. |
| | 13 | 128 | Mill Creek colliery, | George Martin, | Slightly burned, by explosion of gas. |
| | 16 | 129 | Diamond colliery, | William A. Thomas,<br>John Brogan,<br>Frank Wren. | Thomas was burned slightly on face and hands, Brogan and Wren on hands only, all by a small amount of gas exploding over a set of timber in gangway. |
| | 18 | 130 | Empire colliery, | Patrick J. Foley, | Injured slightly by explosion of a blast, that he had returned to re-touch. |
| | 18 | 131 | Franklin colliery, | Thomas Williams, | Leg broken near the ankle; stepped between cars while in motion. |
| | 20 | 132 | No. 2 colliery, Delaware and Hudson, | Ed. Jenkins, | Leg broken, by mule falling on it. |
| | 24 | 133 | Hartford colliery, | B. Robinson, | Injured on back by piece of fireclay, in new slope. |
| | 24 | 134 | Exeter colliery, | M. Corcoran, | Leg injured severely by cars. |
| | 26 | 135 | No. 3 Nanticoke colliery, | John Ryneor, | Injured by explosion of a blast, when returning to re-touch the same. |
| | 27 | 136 | Hollenback colliery, | Fred. Gilbert, | Injured on back, supposed to be dislocated, by fall of rock on him while trying to get it down. |
| Oct. | 3 | 137 | Exeter colliery, | Michael Kintz,<br>Louis Youngs. | Kintz and Youngs were both burned severely on faces and hands, by explosion of a small amount of gas in chamber. |
| | 8 | 138 | No. 2 colliery, Delaware and Hudson, | Hiram Shaffer, | Injured seriously, by fall of top coal. |
| | 8 | 139 | No. 3 colliery, W. Nanticoke, | Ed. Cain, | Collar-bone broken, by fall of top coal. |
| | 9 | 140 | Prospect colliery, | Patrick Haley, | Both legs injured, one broken, by flying coals from a blast. |
| | 13 | 141 | Diamond colliery, | Patrick Mulherin, | Burnt on face and hands, by spark falling from his lamp, and exploding a cartridge of powder which he held in his hand. |
| | 13 | 142 | No. 9 Sugar Notch colliery, | William Davis, | Davis, a door-boy, had face and hands severely burned by explosion of his lamp while opening it, from using kerosene oil. |
| | 14 | 143 | Nottingham colliery, | John H. Davis, | Had two fingers taken off, by a piece of coal falling on them. |
| | 16 | 144 | Exeter colliery, | Frank Loftus, | Severely injured by explosion of a blast; he fired it in the absence of his miner, who was not in; cut match too short, with above result. |

TABLE No. 10.—Colliery Accidents not proving Fatal—Continued.

| DATE. | No. of accident. | NAME AND LOCATION OF COLLIERY. | NAME OF INJURED. | CAUSE OF ACCIDENT. |
|---|---|---|---|---|
| Oct. 15 | 145 | Franklin colliery, | Patrick Hone, | Burned on face and hands by explosion of gas; he said he drilled hole in the dark, and subsequently lit his lamp, with the above result. |
| 17 | 146 | Prospect colliery, | John Gallagher, | Had one leg broken and the other severely bruised, being caught in the moving machinery, where he had no business. |
| 20 | 147 | Diamond colliery, | Thomas G. Thomas, | Injured on head and back, by fall of piece of slate. |
| 24 | 148 | No. 4 colliery, Delaware and Hudson, | John Brogan, | Leg broken and back injured, by a piece of slate falling on him. |
| 28 | 149 | Lance colliery, | Thomas Morgan, | Collar-bone broken, by mule turning and striking him against prop. |
| 29 | 150 | Hutchison colliery, | M. McGlin, | Injured by coals from blast in adjoining chamber; he had been warned, but insisted on passing, when he was struck. |
| 31 | 151 | No. 3 colliery, W. Nanticoke, | G. Stoordocker, | Foot hurt, being caught by dump at head of breaker; he was docking boss. |
| 31 | 152 | No. 3 colliery, W. Nanticoke, | John E. Carver, | Arm broken, by being thrown from mule in the mines. |
| Nov. 4 | 153 | No. 1 Baltimore colliery, | James Sheppard, | Hand severely injured; caught in the wheel while spragging a car. |
| 13 | 154 | Audenried colliery, | John McMahon, | Injured slightly on arm and face, caused by a runaway mule sending truck down shaft, and striking hoisting-carriage, where he was on, about three hundred feet from top. |
| 14 | 155 | Mineral Spring colliery, | William McDonald, | Leg broken by a car on culm-bank, by falling in front of same while in motion. |
| 14 | 156 | No. 10 Sugar Notch colliery, | H. J. Richards, | Leg broken, by a piece of rock falling on him while making place for timber. |
| 18 | 157 | Lance colliery, | Thomas Groilym, | Leg broken by cars, caused by being away from his post. |
| 19 | 158 | Exeter colliery, | Joseph Sheplers, | Burned slightly on face and hands, by explosion of gas in chamber. |
| 19 | 159 | Mill Creek colliery, | Thomas Hagerty, | Injured seriously, while playing with culm cars at foot of outside plane. |
| 25 | 160 | No. 9 Sugar Notch colliery, | Martin Cafferty, | Leg broken in two places, by a fall of roof. |
| 25 | 161 | Franklin colliery, Dobson's drift, | John Hargraves, | Leg broken, by car slipping from off blocks against side, where he was caught. |
| Dec. 1 | 162 | No. 1 slope, Nanticoke, | James Flanery, | Slightly burned by explosion of gas. |
| 1 | 163 | No. 3 colliery, W. Nanticoke, | Newton Frace, | Injured severely on leg and thigh, by falling under mine car, which run over him. |
| 2 | 164 | Nottingham colliery, | John Ryan, | Collar-bone broken and cut on head, by fall of piece of coal on him. |
| 2 | 165 | Washington colliery, | Albert Baker, | Hand severely crushed, by car running over it. |
| 5 | 166 | Empire colliery, | Benjamin Thomas, | Hand severely cut, by a piece of coal flying from solid coal, and striking it. |
| 5 | 167 | Empire colliery, | John Jennings, | Injured on head, face, and leg, by piece of coal striking him amongst loose coals. |
| 5 | 168 | Boston colliery, | Jac. Lewis, | Injured severely by fall of slate. |
| 13 | 169 | Empire shaft colliery, | William L. Richards, | Seriously burned, by explosion of gas in his own working-place—carelessness. |

Total number of injured in above list, 187, classified as follows, to wit: By falls of coal, slates, and materials, 53; by cars in various ways, 47; by gas explosions in various ways, 45; by blasts, 27; by mules, 7; by explosion of powder, 5; miscellaneous, 3. There were a number of others reported as slightly injured, not included in the above list.

TABLE No. 11.—Fatal Colliery Accidents in the Wilkes-Barre District during 1879.

| DATE. | Number of accident. | NAME OF COLLIERY. | NAME OF PERSON KILLED. | Age. | Widow. | Orphans. | CAUSE OF DEATH. | NUMBER OF PERSONS KILLED. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Explosions of gas. | Falls of roof and side. | In shafts. | By blasting powder. | By mine cars. | Miscellaneous. | On surface. | Total. |
| Jan. 7 | 1 | Pine Ridge, | M. Broderick, | | 1 | 1 | Crushed by car running over him in chamber, | | | | | 1 | | | |
| 13 | 2 | Audenreid colliery, | James Boyle, | 17 | | | Fall of coal in chamber; working for his father, | | 1 | | | | | | |
| 14 | 3 | Franklin colliery, | William Stultz, | 21 | | | Crushed between car and side, and fatally injured, | | | | | 1 | | | |
| 27 | 4 | No. 2, Kingston Coal Co., | Patrick Maloney, | 28 | 1 | 8 | Killed by fall of coal while loading a car, | | 1 | | | | | | |
| | | | | | 2 | 9 | | | 2 | | | 2 | | | 4 |
| Feb. 7 | 5 | Sugar Notch, No. 10, | M. Murphy, | 35 | | | Instantly killed by a blast; he had returned to re-touch, as he supposed, | | | | | | 1 | | |
| | | | | | | | | | | | | | 1 | | 1 |
| March 7 | 6 | Wyoming colliery, | Silas Smith, | 16 | | | Killed by fall of roof on gangway road, caused by mule running away, &c., | | 1 | | | | | | |
| 12 | 7 | No. 2, D. and H. colliery, | Thomas Ruthford, | 55 | 1 | 2 | Killed instantly by fall of rider coal or roof, | | 1 | | | | | | |
| 15 | 8 | Exeter colliery, | P. Hess, | | | | Both men killed same time and place; discovered following day, by fall of roof, | | 1 | | | | | | |
| | | | Peter Frederick, | | | | | | 1 | | | | | | |
| 24 | 9 | Empire colliery, | James Griffith, | 52 | 1 | 4 | Both killed at same time and place by fall of top coal, | | 1 | | | | | | |
| | | | Ed. Mitchel, | 36 | 1 | 6 | | | 1 | | | | | | |
| | | | | | 3 | 12 | | | 6 | | | | | | 6 |
| April 10 | 10 | Midvale colliery, | W. Johnson, | 16 | | | Killed by being caught in wheel on roller-shaft in breaker while oiling, | | | | | | | 1 | |
| 14 | 11 | Henry colliery, | James Barrett, | 12 | | | Killed by runaway trip of loaded cars striking light ones, he being on, | | | | | 1 | | | |
| 14 | 12 | Sugar Notch slope, No. 10 | S. Corrighan, | 35 | 1 | 8 | Killed by piece of fireclay falling on him on gangway road, | | 1 | | | | | | |
| 14 | 13 | Empire colliery, | W. McLaughlin, | 30 | | | Fatally injured by piece of coal falling on him in cross-cut, | | 1 | | | | | | |

TABLE No. 11.—Fatal Colliery Accidents—Continued.

| DATE. | Number of accident. | NAME OF COLLIERY. | NAME OF PERSON KILLED. | Age. | Widow. | Orphans. | CAUSE OF DEATH. | NUMBER OF PERSONS KILLED. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Explosions of gas. | Falls of roof and side. | In shafts. | By blasting powder. | By mine cars. | Miscellaneous. | On surface. | Total. |
| April 25 | 14 | Audenreid, . . . . . | Frank Miller, . . | 14 | . . . | . . . | Killed by runaway car striking empty car, which caught and crushed him, . . . . . | . . | . . . | . . . | . . . | 1 | | | |
| | | | | . . . | 1 | 8 | | . . . | 2 | . . . | . . . | 2 | . . . | 1 | 5 |
| | | | William Smith, . . | 35 | 1 | 2 | Messrs. Smith, Morgan, Davis, Watkins, Lloyd, and Faull were fatally injured, and expired one after another in a short time, from the effects of burning with gas while trying to extinguish a mine fire, . | 1 | | | | | | | |
| | | | D. B. Morgan, . . | 40 | 1 | 4 | | 1 | | | | | | | |
| May 6 | 15 | Audenreid colliery, . | John Davis, . . . | 35 | 1 | 4 | | 1 | | | | | | | |
| | | | William Watkins, | 25 | 1 | . . . | | 1 | | | | | | | |
| | | | Sem. Lloyd, . . . | 45 | . . . | 5 | | 1 | | | | | | | |
| | | | Richard Faull, . . | 36 | 1 | 4 | | 1 | | | | | | | |
| 13 | 16 | No. 4 slope, Nanticoke, | L. Snyder, . . . | 28 | 1 | . . . | Killed by fall of top coal through his own reckless action, . . . . . | . . . | 1 | | | | | | |
| 20 | 17 | Henry colliery, . . . . | John Schumaker, . | 20 | . . . | . . | Fatally injured by car running over him, | . . . | . . . | . . . | . . . | 1 | | | |
| 28 | 18 | Wyoming colliery, . . . | Samuel Davis, . . . | 43 | 1 | 4 | Fatally injured by gas explosion through the carelessness of Davis himself and his partner, T. J. Evans, . . . . . | 1 | | | | | | | |
| | | | | . . . | 7 | 23 | | 7 | 1 | . . . | . . . | 1 | . . . | . . . | 9 |
| June 11 | 19 | Empire colliery, . . . . | James Keeny, . . . | 40 | 1 | . . . | Fatally injured, as he expired some time after accident at city hospital, caused by being crushed between cars, . . . . . | . . . | . . . | . . . | . . | 1 | | | |
| 14 | 20 | Sugar Notch colliery, . | B. McGrain, . . . . | 70 | 1 | 6 | Killed instantly by fall of top coal, an old and experienced miner, . . . | . . | 1 | | | | | | |
| 17 | 21 | Laurel Run colliery, . . | West Everett, . . . | . . . | . . . | . . . | Injured fatally by culm car, by his own carelessness; died July 9, . . . . . | . . . | . . . | . . | . . | 1 | | | |
| 20 | 22 | Enterprise colliery, . . | John Quinn, . . . . | 41 | . . . | . . . | Fatally injured while taking down piece of bad roof; laborer also injured, but only slightly, | . . . | 1 | | | | | | |
| 20 | 23 | Mill Creek colliery, . . | Charles Rannard, . | . . . | . . | . . . | Fatally injured by a thin piece of rock falling on him, breaking over props, . . . . . | . . . | 1 | | | | | | |
| | | | | . . . | 2 | 6 | | . . . | 3 | . . . | . . . | 2 | . . . | . . . | 5 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 18 | 24 | No. 2 colliery, K. C. Co. | David Williams, | 20 | | | Fatally injured by coals from a blast in adjoining chamber; died on 31st instant, | | | | | | 1 | | | | |
| | 24 | 25 | No. 5, D. and H. colliery | John O'Brien, | 15 | | | Killed by car going down grade and striking the empty trip, killing a mule and this boy, | | | | | | | | | | |
| | 25 | 26 | Dodson colliery, | C. G. Case, | 53 | 1 | 3 | Killed by car running over him near shaft foot, | | | | | 1 | | | | | |
| | 24 | 27 | Forty Fort colliery, | D. R. Thomas, | 35 | 1 | 2 | Killed by fall of rock in chamber, | 1 | | | | | | | | | |
| | 25 | 28 | Hutchison colliery, | John Gibbons, | 40 | 1 | | Killed by a blast while attempting to pass the place after signal had been given by party firing, | | | | | | 1 | | | | |
| | 30 | 29 | Warrior Run colliery, | Dennis Boyle, | 30 | | | Killed by fall of slate in gangway; carelessness in not taking it down by miner, | | 1 | | | | | | | | |
| | | | | | | 3 | 5 | | | 2 | | | 2 | 2 | | | 6 | |
| Aug. | 2 | 30 | Empire colliery, | A. Langan, | | 1 | 8 | Killed by fall of roof, bone, and slate, | | 1 | | | | | | | | |
| | 6 | 31 | Nottingham colliery, | John Edwards, | 58 | 1 | | Fatally injured by explosion of half keg of powder through his carelessness; died on 11th instant, | | | | 1 | | | | | | |
| | 9 | 32 | Lance colliery, | Elias Williams, | 38 | 1 | 4 | Killed by car jumping off track and crushing him against bottom, | | | | | 1 | | | | | |
| | 11 | 33 | Raubville, or Waddell's colliery, | Thomas Penrose, | 45 | 1 | | Both killed instantly by fall of slate from | | 1 | | | | | | | | |
| | | | | Thos. McCormick, | 25 | | | roof on gangway, | | 1 | | | | | | | | |
| | 13 | 34 | No. 3 W. Nanticoke col'y | D. Williams, | 14 | | | Killed by piece of coal dropping on him, on gangway, just at hind end of car, | | 1 | | | | | | | | |
| | | | | | | 4 | 12 | | | 4 | | 1 | 1 | | | | 6 | |
| Sept. | 6 | 35 | No. 4 slope, Nanticoke, | William Cramer, | | | | Killed by fall of top coal, through his carelessness in not propping the same, | | 1 | | | | | | | | |
| | 24 | 36 | No. 3, Baltimore col'y, | Thomas Leonard, | 16 | | | Killed by a mule outside. He fell and got foot fast in the harness, and mule ran away with boy fast, with the above result, | | | | | | | | 1 | | |
| | 25 | 37 | Hartford colliery, | Peter Harlon, | 29 | 1 | 2 | Killed instantly by a fall of bony coal, | | 1 | | | | | | | | |
| | 27 | 38 | Prospect colliery, | E. E. Davis, | 40 | 1 | 5 | Killed by piece of rock falling on him when taking down brattice boards, | | 1 | | | | | | | | |
| | 29 | 39 | No. 2 tunnel, Nanticoke | John H. Morgan, | 38 | 1 | 6 | Killed by fall of top coal, through his own indiscretion, in not putting in temporary timber, | | 1 | | | | | | | | |
| | | | | | | 3 | 13 | | | 4 | | | | | | 1 | 5 | |
| Oct. | 2 | 40 | Midvale colliery, | Con. McGroarty, | 32 | 1 | 5 | Killed by fall of rock at corner of chamber and gangway, | | 1 | | | | | | | | |
| | 14 | 41 | No. 2 tunnel, Nanticoke | J. Poloshofsky, | 35 | 1 | 2 | Killed by fall of rock while robbing pillars, | | 1 | | | | | | | | |
| | 25 | 42 | Nottingham colliery, | J. Conahan, | 14 | | | Killed by cars running over him which he had just unhitched from mule, | | | | | 1 | | | | | |
| | 25 | 43 | Diamond colliery, | J. Higgins, | 32 | | | Killed by fall of top coal in chamber, | | 1 | | | | | | | | |
| | | | | | | 2 | 7 | | | 3 | | | 1 | | | | 4 | |

**TABLE No. 11.—Fatal Colliery Accidents—Continued.**

| DATE. | Number of accident. | NAME OF COLLIERY. | NAME OF PERSON KILLED. | Age. | Widow. | Orphans. | CAUSE OF DEATH. | NUMBER OF PERSONS KILLED. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Explosion of gas. | Falls of roof and side. | In shafts. | By blasting powder. | By mine cars. | Miscellaneous. | On surface | Total. |
| Nov. 2 | 44 | Mill creek, | Zac. Thomas, | 38 | 1 | 4 | Thomas, Jenkins, Kinny, Forsyth, and Rupp were killed by the effects of an explosion of gas, explained elsewhere in this report, | 1 | | | | | | | |
| | | | David Jenkin, | 66 | 1 | 3 | | 1 | | | | | | | |
| | | | William Kinney, | 24 | 1 | . . . | | 1 | | | | | | | |
| | | | George Forsyth, | 38 | 1 | 7 | | 1 | | | | | | | |
| | | | David Rupp, | 35 | 1 | 3 | | 1 | | | | | | | |
| 13 | 45 | Exeter colliery, | Martin Williams, | 35 | 1 | . . . | Killed by empty cars running over him in face of chamber, | . . . | . . . | . . . | . . | 1 | | | |
| 21 | 46 | No. 2 colliery, Kingston Coal Company, | Samuel Hill, | 40 | 1 | 5 | Fatally idjured by a piece of slate falling on him, | . . . | 1 | | | | | | |
| | | | | . . | 7 | 17 | | 5 | 1 | . . . | . . . | 1 | . . | . . | 7 |
| Dec. 2 | 47 | Red Ash colliery, Red Ash Coal Company, | Robert V. Thomas, | | 1 | 5 | Fatally injured by being caught between car on slope and side, | . . . | . . . | . . . | . . . | 1 | | | |
| 4 | 48 | Hollenback shaft, | Roger Manley, | 15 | . . . | . . . | Killed by car striking him when opening his door, he being door-boy, | . . . | . . . | . . . | . . . | 1 | | | |
| 6 | 49 | Wyoming colliery, | Ed. Killgallon, | 15 | . . . | . . . | Killed by mule pulling car off track, whereby boy was caught against the side, | . . . | . . . | . . . | . . . | 1 | | | |
| 17 | 50 | No. 4 col. D. & H. C. Co. | Jac. Boyer, | 42 | 1 | 6 | Killed by fall of coal in his own place, | . . | 1 | | | | | | |
| 17 | 51 | Prospect colliery, | John Steel, | 30 | . . | . . . | Fatally burned by explosion of nearly a full keg of blasting powder; died on the 22d instant, | . | . . | . . . | 1 | | | | |
| 20 | 52 | Nottingham colliery, | James Reynolds, | 45 | 1 | 8 | Fatally injured by piece of coal falling on him; died on 22d instant, | . . . | 1 | | | | | | |
| 23 | 53 | Henry colliery, | Thomas Gaharty, | 35 | 1 | 5 | Fatally injured by being scalded by falling into sump; died same day, | . . . | . . . | . . . | . . . | . . . | 1 | | |
| | | | | . . | 5 | 28 | | . . . | 2 | . . . | 1 | 3 | 1 | . . | 7 |
| | | Totals, | | . . . | 39 | 140 | | 12 | 30 | . . | 2 | 15 | 4 | 2 | 65 |

# LUZERNE AND CARBON COUNTIES.

## EASTERN DISTRICT.

To his Excellency Henry M. Hoyt,

*Governor of the Commonwealth of Pennsylvania:*

Sir: I have the honor herewith to present to your Excellency my annual report as inspector of coal mines for the Eastern district of Luzerne and Carbon counties, for the year ending December 31, 1879, as required by an act of Assembly, entitled "An act providing for the health and safety of persons employed in coal mines," approved March 3, 1870.

I have compiled tables on accidents, as required by the twenty-second section of the aforesaid act. From these tables it will appear that fifty-nine persons lost their lives during the year, and that one hundred and thirty-four were seriously injured, and one hundred and thirty-two slightly injured. I have made such explanatory remarks on each fatal accident as my investigations warranted, from which it will be observed that the same complaint is made as in former years, that nearly every accident was the direct result of the most strange and unaccountable recklessness and carelessness, or disobedience of orders, on the part of the unfortunate victims themselves, or of those working near them. The necessary discipline in the mines to reduce those accidents seems to be utterly unattainable; and until we have additional legislation to create a code of rules for the government of mines, I have but little hope that the reform desired in this respect will ever be effected. But as I treat of this matter on another page, I most respectfully refer your Excellency to my views, as there set forth.

The loss of life was greater last year than for the year 1878, though I did all in my power to induce the bosses and workingmen to exercise unusual care in working; but my warnings, for the most part, were unheeded, and the harvest of death has gone on in spite of my best efforts to stop its ravages. The number of deaths during the year is fifty-nine, against thirty-four for 1878, being an increase of twenty-five. It is true that the number of tons of coal mined during last year was much greater than during the year previous, but I am sorry to say that the increase in the quantity of coal mined does not equal the increase in fatal casualties. The number of tons of coal mined for each life lost during 1878, was 145,394; but during 1879, the

ratio fell to 121,730 tons per life lost. Still, we must bear in mind that the year 1878 was an extraordinarily favorable one, leaving last year considerably better than the average. The number of widows for 1879 is thirty-one, with one hundred and twenty-five orphans; while the number of widows for 1878 was only nineteen, and the number of orphans, seventy-two, showing an increase of twelve in the number of widows, and an increase of fifty-three in the number of orphans; but a large percentage of the latter for last year are full grown and self-supporting.

The deaths are chargeable to the following causes: Explosions of carbureted hydrogen gas, three; falls of roof, twenty-two; falls of coal, eight; falling down shafts, three; explosions of blasting powder, four; premature blast, one; crushed by mine cars, ten; miscellaneous underground, two; and six above ground. It is with much disappointment that I record the three deaths from explosions of gas, but I am glad that not one of them was caused by inadequate ventilation. There was no necessity for any one being burned with gas, and the only manner in which explosions occurred was through the most inexcusable neglect of parties in charge of the ventilation of the collieries. It is said that men go where they have no business to go, and get burned in that manner. That may be true, but it is also true that the bosses have no business to allow gas to accumulate and lodge in any part of the mines. Were they to keep the mines clear of "standing gas," as the law requires, no one could cause an explosion. When any person is burned by an explosion of gas, it is asserted, very often, that "he had no business to go there;" but, under the law, I answer rather, that the gas had no business to be there for any one to run into.

I am happy to state that the work of improving the condition of the mines, as regards ventilation, has progressed very satisfactorily during the year. Seven new fans were erected, and much inside work was performed to this end. The real condition of the mines in this respect is set forth minutely in table No. 9, and my remarks thereon, which you will please find on another page. There are a few collieries that have poor ventilation still, but their owners, or their agents, I trust, will attend to them before the end of the current year. All concerned are to be congratulated that so much has been accomplished; and in view of the very unprofitable state of the coal trade during the past few years, more has been done than the most sanguine could hope for.

In the body of my report, I have expressed my views on several matters, which, in my opinion, bear directly on the preservation of the health and lives of persons employed in and about coal mines. In all that I have written I have confined myself to subjects bearing upon the great object of the law creating my office, and I have followed this course, believing that I had no right to load my report with matter foreign to that object.

And now, with sincere gratitude to all who have coöperated with me in my efforts to carry into effect the provisions of the law which I am oath-bound to enforce, and humbly soliciting a continuance of the pleasant re-

lation existing between me and the mass of the mine officials in the district, the following pages are respectfully submitted to your Excellency, by

Your most humble, obedient servant,

WILLIAM S. JONES,
*Inspector of Coal Mines.*

Scranton, Pa., *March 6, 1880.*

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**Deaths from Explosions of Carbureted Hydrogen Gas.**

There were three deaths caused by explosions of carbureted hydrogen gas during the year 1879, in this district, being five per centum of the whole number of deaths for the year. There was not the least shadow of an excuse for any or either of them, as the following remarks will demonstrate to the entire satisfaction of all concerned.

Accident No. 1.—Peter P. Daley, a mine boss at No. 4 shaft, Pennsylvania Coal Company, Jenkins township, was so severely burned by an explosion of gas, on the morning of January 9, that he died at seven o'clock, P. M. of the same day. Daniel Loftus, a stable boss, was also seriously injured by the concussion of the explosion, being violently thrown for a long distance, fracturing several of his ribs.

The gas was generated a long distance away from the scene of the explosion, in the workings of No. 7 shaft. For some days previous to this date, the workings in No. 7 had been caving in, bringing down a large quantity of gas from the strata above, and discharging it in large bodies into the return air from No. 7, on its course to the up-cast at No. 4. It was well known, that an immense body of gas had been discharged by the aforesaid cave, and that it was on its way to No. 4 shaft, and three doors had been erected on the gangway leading to the foot of the last named shaft, to turn the gas when it came, to the up-cast air-shaft. These doors were put in with board brattice sides and tops, and were very far from being air-tight. But the door nearest to the foot was made as near air-tight as it could be made with the material used. It was packed with manure, &c., and braces put against it, so that no one would be likely to open it. But the two inner doors were ricketty concerns, as far as I could learn, little better than none at all. This was the condition of affairs, on the evening before the explosion.

On the morning of the explosion, Daley descended the shaft, with the first carriage load of men, and on reaching the bottom, the men went to the south side of the shaft, on their way to their work, while Daley went to the north side of the shaft, to examine as to whether the gas had reached the doors referred to above, or not. It is very evident, that he anticipated danger there, for he went expressly to examine that section, expecting to find the gas there, and yet he must have walked right into the gas with his open light. It is impossible to determine definitely, how far he had gone when he ignited the gas, as he could not be induced to explain how the explosion occurred. When interrogated in relation to the matter, his answer

was: "I will explain it all another time—after I get well." But the unfortunate man died with the secret unsolved.

The probability is, however, that Daley did not get far inside of the outside door, and it is my opinion that the gas exploded immediately on his opening this door. When he came to this door, he undoubtedly thought himself safe enough with a naked light, otherwise he would have left his open lamp at the head of the shaft, as he should have done. Then, trusting to the two other doors inside, he boldly opened this outer door, when the gas instantly came in contact with the flame of his open lamp, and exploded. If the inside door had been stuffed, and made air-tight, instead of the outside one, this could not have happened. But as it was, the gas had leaked through the ricketty inside doors, and had lodged against the outside one, which being air-tight, barred its further passage. It may be barely possible, that he had reached the middle door before the gas exploded, but it seems almost incredible that he had ventured so far with a naked light. When found, he was lying just inside of the outside door, at the point marked B, on the accompanying plan. His safety lamp, miner's lamp, tape, cane and hat, were found at the points indicated on the plan.

The force of the explosion was so great that it overturned and shattered to pieces a large number of loaded mine cars, many of which were standing a long distance away, on the south side of the shaft; it wrenched the guides, buntons, and timbering in the shaft out of place, and blew away a part of the tower sidings at the top, and injured the fan so that it could not be used; and at the bottom of the shaft a pump of immense weight was moved bodily out of place. As a matter of course, all the doors, brattice, stoppings, and the flooring of the stable, were torn away and shattered into shreds; in short, the shaft and its surroundings were reduced to a complete wreck.

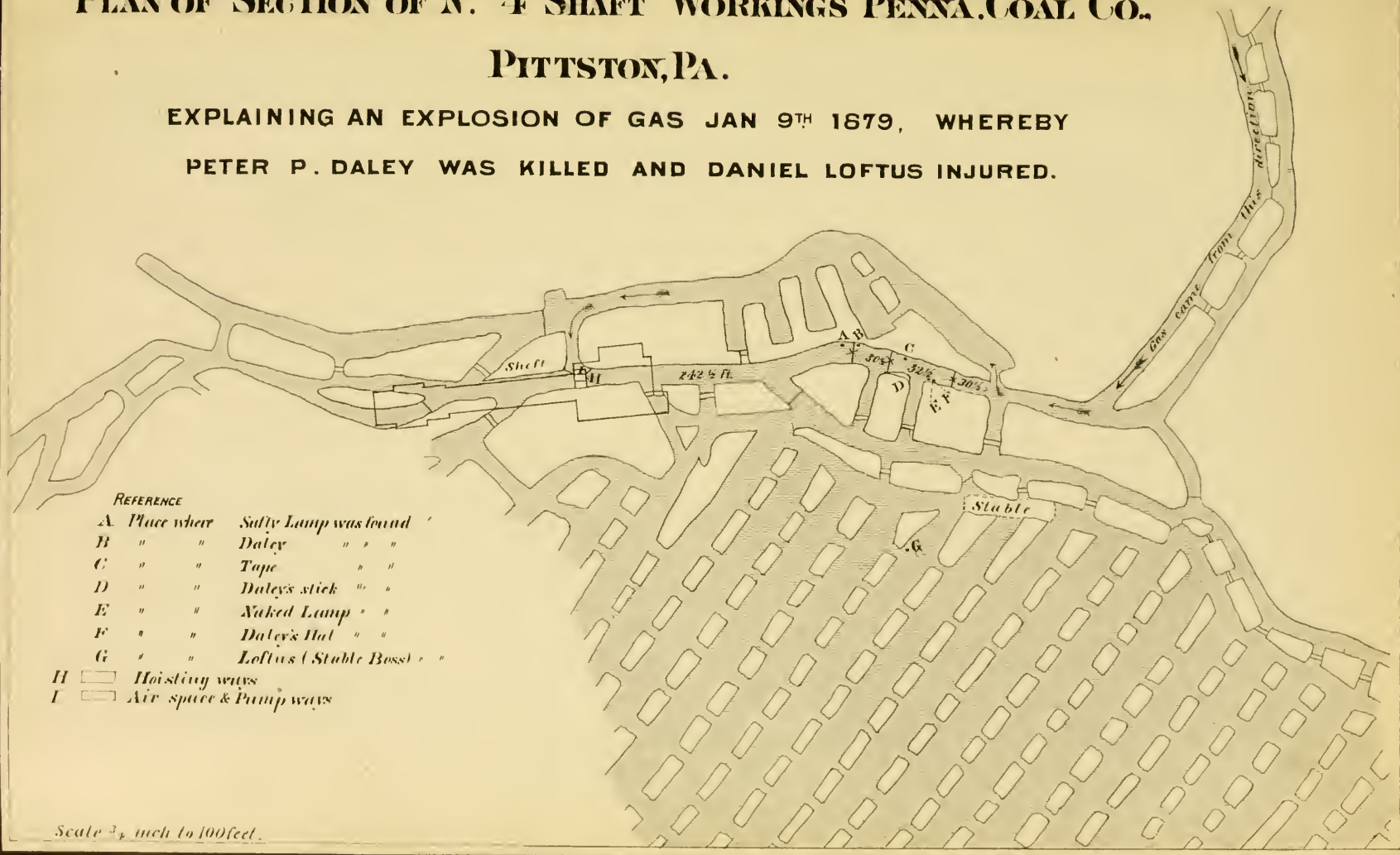
It is impossible to avoid the inquiry: How did this body of gas lodge here at the foot of the upcast shaft, exactly under the fan? And I know of no possible way to answer the inquiry but by concluding that the fan must have been stopped during the night preceding the explosion. It is but fair to state, however, that the mine superintendents assert that the fan was not stopped, and I am very willing to admit that they believe what they assert. But they must allow me to differ with them until they can explain how the gas lodged there, in some other way. I was satisfied at once that the fan had been stopped, and I have learned since, from wholly disinterested parties, that such was the fact. Then, there must have been a motive for stopping the fan, and the motive is at hand and admitted, and is found in the fact that the shaft is wet, and that the night of January 8th was very cold, hence the fan was stopped to stop the draft in the shaft, thus stopping the dripping water in the shaft from freezing on the buntons and guides. This is still continually done by mine officials, notwithstanding that I have repeatedly ordered the practice discontinued. But superintendents and mine bosses refuse to follow my direction, and often pay

PLAN Nº 1.

# PLAN OF SECTION OF Nº 4 SHAFT WORKINGS PENNA. COAL CO.

## PITTSTON, PA.

EXPLAINING AN EXPLOSION OF GAS JAN 9TH 1879, WHEREBY PETER P. DALEY WAS KILLED AND DANIEL LOFTUS INJURED.



the penalty of such refusal by just such accidents as the one under discussion. The victim of this accident was very imprudent in this respect, ignoring the plain requirements of the law as it suited his convenience. Then, when we notice that No. 7 shaft was the downcast for this current of air, and that the difference in the elevation between No. 7 and No. 4 shafts was only seven feet, we see at a glance that the natural current would be hardly perceptible, and it will be easy to understand how the gas lodged in those sharp angles approaching the foot of the upcast at No. 4 shaft, when the fan was not running.

It is very plain that there was no earthly necessity for this explosion to occur. If Peter P. Daley, or someone else, had not ordered the fan stopped no gas could have lodged there. If he had left his naked light on top of the shaft, as he should have done, and had gone down to search for the gas with only a safety-lamp, it is very improbable, at least, that an explosion would have occurred. It is also in evidence that he allowed eight other men to descend the shaft on the same carriage upon which he went down himself, whereas the law provides that the mine must be examined for gas "every morning before the miners enter," and says that, "the workmen shall not enter the mine until such examination has been made and reported, and the cause of danger, if any exist, be removed." It was very fortunate in this case that time enough had elapsed, between the descent of the shaft and the explosion, to enable the eight men, aforementioned, who went to the south side of the shaft, to get far enough away to escape the force of the explosion. They were not injured, but had the explosion occurred a few minutes sooner, they would have been in the midst of a large number of loaded mine cars that were thrown violently about and wrecked, and would all have received injuries more or less serious, and some of them undoubtedly would have been killed.

Peter P. Daley was of Irish nationality, fifty-nine years of age, and left a widow, with three grown up children, to mourn his untimely death.

Accident No. 30.—Robert J. Moses, a driver in the Clark vein of the Bellevue shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was fatally burned August 6, by an explosion of gas. All the working-places in the Clark vein in this shaft evolve gas in large quantities, and require constant care and watchfulness to keep it from lodging; but with proper care, and with the quantity of air provided for the workings, it need not lodge, and an explosion need never occur. This explosion occurred in the chamber of William T. Williams, which generated gas largely, but a sufficient quantity of air was provided to dilute it as it was generated, provided the air-current had been forced well on to the face. The quantity of air was over eighteen thousand cubic feet per minute, but the brattice from the last cross-heading through the pillar had been left too far back, so that the air did not sweep the whole face of the chamber. After putting in an additional length of brattice, not a particle of gas could be found in the place. From the evidence adduced on the in-

vestigation, it appeared that no accumulation of gas had taken place until late in the afternoon, and only a short time before the explosion. The miner had fired a blast just before going home, which had developed an additional blower, from which he expected a lodgment of gas to take place, and which did take place as he expected. In going to the foot of the shaft on his way home he met the driver, and told him not to go in near the face, (when he should enter the chamber with an empty car,) with his lamp in his hat, but to be sure to keep his light down. Moses, however, as is too often the case, disregarded this warning and went in with his lamp on his head, which ignited the gas, burning himself quite seriously. It is in evidence, also, that the miner, when on his way home, met John Hale, the mine boss; that he spoke to him about the additional blower, and that John Hale intended to have an additional length of brattice put in the next morning. But before that time had arrived, the gas had exploded, doing its deadly work.

James Foster, the laborer belonging to the chamber, was present when the explosion occurred, but he escaped unharmed by dropping instantly to the thill, when he saw the gas go off. He then hurried down the chamber-road, but on looking back he saw that Moses' clothing was on fire, and he returned to his assistance, tore the burning shirt from his back, and led him down the road a short distance, where he left him, for a minute, to get his own coat, to throw over him to shield his burns from the action of the air. Moses, however, did not wait for the coat, but ran wildly, naked as was, to the foot of the shaft, exposing his burns to the cold current of air passing, which was greatly to his injury. However, the boy did not seem to be so badly burned as to endanger his life, had he received proper care and attendance. He was afflicted with fearful bed-sores, which became aggravated by a severe attack of diarrhœa, the combined effect of which, with his burns, ended in his death on the 20th of September. Moses was an American by birth, of Welsh parents, and was seventeen years of age.

ACCIDENT No. 55.—Walter Price, a miner at the Taylor shaft, Delaware, Lackawanna, and Western Railroad Company, Lackawanna township, was fatally burned, December 9th, by an explosion of gas, ignited by himself. William Carter, a driver, was also dangerously injured, receiving fearful cuts in the head by being thrown by the concussion of the explosion. The gas had been allowed to accumulate in two abandoned chambers, on a gangway known as the east gangay, from the foot of an inside slope on the east side of the shaft. These chambers run nearly south from the gangway a distance of two hundred and seventy-five feet, and no work had been done in them for about five months, during which time the gas had lodged in them. The gangway had, also, been stopped for some time, but Price, on the day of the accident, had been sent there to resume the work of driving it. On reaching the face he found that there were heavy scales of rock hanging from the roof, which needed taking down, and in order to reach them he brought an old, broken, wooden horse there to stand on, but the

horse needed repairing, and Price entered one of the old chambers referred to, in search of a piece of board to repair it. On reaching to within ten to fifteen yards of the face, his light ignited the gas, causing the explosion. It may be true that Price had no business to enter these old chambers, but it is also true that the gas had no business there. Thomas H. Jenkins, the fire boss, knew that a body of gas was standing there, but said nothing about it to any one, and at the same time neglected to put up fire signals at the approaches to the chambers containing it. He admitted, on the examination, that he had found gas there on December 1st, which was the last time he had been through there. He evidently erred, in two respects, in the case. First, knowing that there was standing gas there, he should have reported it to the mine boss, so that it might be cleared away. Secondly, knowing standing gas to be there, he should have placed fire signals at all the approaches to it until it was cleared away.

Jenkins, however, is very careful and faithful in the discharge of his duties as fire boss. He travels through all the "old workings" as often as once per week, in addition to his daily rounds through every working place, of which he has sixty-seven places to examine. And when we bear in mind that the colliery is a very fiery one, and that gas will lodge and accumulate there where there is the least shade from the air current, we must give him and Morgan Harris, the mine boss, great credit for the splendid condition in which they keep the colliery. Of course the higher officials of the company deserve credit, also, for providing the necessary quantity of air to work the colliery safely, and it gives me great pleasure to accord them the credit they deserve.

But I cannot avoid the conviction, that the fire boss in the Taylor colliery is expected to do too much. The workings being so extensive, it takes him full three hours to make his rounds in the morning, before the men are allowed to enter the shaft, and then he is forced to make too much haste, in order to get around in that time. He cannot examine the workings as thoroughly as he ought to, when forced to go through them in such haste. After making his rounds, and letting the workmen in to their work, he ascends the shaft to breakfast, and then returns, and works all day, putting in doors, brattice, stoppings, &c., in such places as they may be required, and has no further time during the day to go through the workings. In my opinion, the fire boss in so fiery a colliery as is the Taylor shaft, should have his whole time to watch the working places, and the work of putting in doors, brattice, stoppings, &c., should be done by other men employed especially for that purpose.

But to return to the accident. When I visited Walter Price, the day following the explosion, he did not seem to be seriously burned, and I thought then there was no danger of his dying, and that too, seemed to be the opinion of Doctor J. W. Houser, who attended him. But it seems that some new patent oil, or liniment was applied to his burns, which drove the fire inwardly, in place of drawing it out, and to my great surprise, as I was

passing by on the morning of December 13, Doctor Houser informed me that he had died early that morning.

Walter Price was of Welsh nationality, forty-five years of age, and left a widow with six children, in poor circumstances to mourn his loss.

#### Non-fatal Accidents from explosions of Carbureted Hydrogen Gas.

I do not intend to make any remarks on each of the non-fatal accidents, as that would swell my report to undue proportions, but I deem it profitable to refer to one or two of those that occurred from explosions of carbureted hydrogen gas, because of the lesson they teach for the future guidance of such as may be in charge of fiery collieries. In relation to these accidents, I must be allowed to repeat with emphasis, what I have said in substance in my former reports. That not one of them that occurred during the year, but might be easily avoided with such watchfulness and care, as should be exercised by those in charge of our collieries.

I am very sorry to see the tendency of some of the higher officials of our mines to defend and champion all manner of recklessness and want of care, and even the most direct violations of the very letter and spirit of the mine ventilation act, bearing upon the matter; and while this continues, I feel that there is but very little hope that we shall succeed in putting an end to these explosions. I desire one thing to be distinctly understood, however, and that is, that those parties who thus obstruct the enforcement of the law must assume the responsibility for these accidents. I feel as positive that they can be averted by the exercise of proper care, as I am of my own existence; and if the provisions of the mine law were carried out faithfully, and in there entirety, the public would soon see that explosions of gas would never occur in our mines.

ACCIDENT No. 98.—By reference to table No. 2, it will be seen that five men were injured, September 24, by an explosion of gas in the Sloan shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, three of whom were severely burned. The names of the men are as follows: Morgan James, (fire boss,) Edward James, (brattice man,) George Price, (driver,) John Evans, (track layer,) and Joseph Evans, (laborer,) the three last named being quite seriously injured.

I received notice of the explosion late in the afternoon of the same day, and visited the colliery early the following day to investigate the cause of the explosion. In company with John T. Williams, the mine boss in charge of the colliery, I descended the shaft, and entered to the section where the explosion occurred, where I found things blown about considerably—stoppings blown out, doors and brattice torn away, cars overturned, &c. As the air was not circulating properly, and as the place was insufferably hot, I could not make a thorough investigation at this time.

On September 27, I again visited the scene of the explosion, and examined the place and surroundings with more care and thoroughness. On this occasion I found where two doors had been torn away, one of which was located twenty-six yards outside o the point where the gas was ignited,

and the other was fifty yards outside of that. Just twelve yards outside of the last mentioned door, I found a stopping blown out into the gangway, and towards the point where the force of the explosion was greatest, and as some of the men supposed that the gas came out upon them from the direction of this stopping, out of a range of old workings, on an old gangway, known as "Elias Hughes' gangway," I resolved to explore them carefully, to convince all concerned that the gas did not come from that quarter. I did so, and instead of finding any indication of the explosion having occurred there, I found the very strongest indications to warrant the conclusion, not only that the body of the gas was not in these old workings, but that the effect of the explosion did not reach that section at all. Amongst other signs were the following: An empty powder keg standing undisturbed where it had been left a short time previous, a cap-piece hanging from the top of a loose prop, and the general absence of dust, or anything of the kind, over the place.

We then returned to Elias Hughes' gangway, and into Rees W. Lloyd's old chamber, which runs parallel with the gangway where the explosion occurred, and which is holed through into said gangway. Here we found signs of the force of the explosion having been very great—stoppings blown out, props discharged, and the gob piled up in ridges against the pillars. The far end of Lloyd's chamber was holed through to Heycock's chamber, which is opened from Dando's air-way. There were but very slight signs of the explosion near the face of Heycock's chamber, but on Dando's air-way the indications were that the explosion was very strong in toward the face, but its force was expended, however, before the face was reached. We next entered Thomas Jones' gangway, and here we found a large body of gas, extending back twenty yards from the face, to the last entrance holed through to the air-way. The explosion had been very fierce along this gangway for a distance of over three hundred yards back from the face, and the men who were injured were nearly that distance off. All the stone wall stoppings between the gangway and the air-way were swept away, and a clod of rock had been melted by the intense heat, and had fallen from the roof for a considerable distance. Now, after making thus a thorough examination of the colliery, to enable me to understand its true condition at the time of the explosion, I then proceeded to examine the mine boss and fire-boss, whose statements I insert in their own words, and which are as follows:

*John T. Williams' statement.*—"My name is John T. Williams. Reside in Hyde Park. Am mining boss by occupation. Have charge and full control of all the inside workings of the Sloan shaft, owned and operated by the Delaware, Lackawanna and Western Railroad Company, and located in Lackawanna township. Have been in charge of the shaft for seven years—ever since the colliery was opened. I know all about the nature and condition of the colliery, as to its generating gas. Up to two years ago we considered the colliery to be quite fiery, but for the last two years

it has been better, there being less gas than in former years. The whole colliery generates gas even now, but there are two sections, consisting of Gallagher's and William B. Davies' gangways, where it is not necessary to carry brattice from one entrance to the other to clear away the gas. All the old workings are kept clear of gas. The fire boss travels through all of the old workings to examine them, as often as once per week—generally on Fridays. I never knew of any large accumulation of gas in the colliery. Cannot say whether it was filled with gas during the 'strike' in 1877 or not, no one entered it at that time. Never heard the superintendent say that it was full of gas at that time, but I did hear other people talk of it. The fan was stopped in 1877 for a part of five days. It was stopped on Thursday, and was standing until the following Monday.

"The condition of the colliery, when examined about seven o'clock on the morning of the 24th instant was reported to me by Morgan James, the fire boss, as being good. It had been examined by the fire boss; did not examine it myself. The fan was not running when the explosion occurred. It had been stopped for fifty hours. It was stopped at half past eight, A. M., on Monday, and the explosion occurred at ten minutes past ten, A. M., on the following Wednesday. I was at the foot of the shaft when the explosion occurred. Had seen the fire boss about half an hour previous, and I asked him, as I always did, 'How is the gas to-day?' And he answered, 'It is better than it was yesterday.' And he said further, 'I did not find any gas in Mark's gangway, until I got inside of the cross-cut,' and in the gangway where the explosion occurred, he said there was eighteen inches of gas at the end of the brattice, about ten yards out from the face.' This is called 'Tom Jones' gangway.' He also assured me there was no gas standing in the high chambers in the gangway known as 'Jonesie's gangway.' This statement of the fire boss did not seem natural to me under the circumstances. The weather was cloudy that morning, so that I expected that there would be more gas than the day before. Still, I accepted the statement of the fire boss as being satisfactory, and thought perhaps the wind had changed so as to blow down the slope, thus increasing the natural current of air in the mines, but I did not know such to be the case.

"It is my opinion, that the gas that accumulated in the high roof in Tom Jones' gangway, escaped, for the most part, from near the face of said gangway, and lodged in the high section in the rock cut, while some of it may have been evolved from the top coal in that place. The gas was fired at a distance of about eight hundred and fifty feet from the face of the gangway. There was a lodgment of gas, in my opinion, for about five hundred feet of this distance, which would leave about three hundred and fifty feet between the high roof in the rock cut, and the high roof at the face where the top coal had been taken down, thus dividing the gas into two bodies. Both these bodies of gas exploded. Think there can be no doubt of that. Think the gas near the face of the gangway was brought in con-

PLAN No.2

# PLAN & SECTION

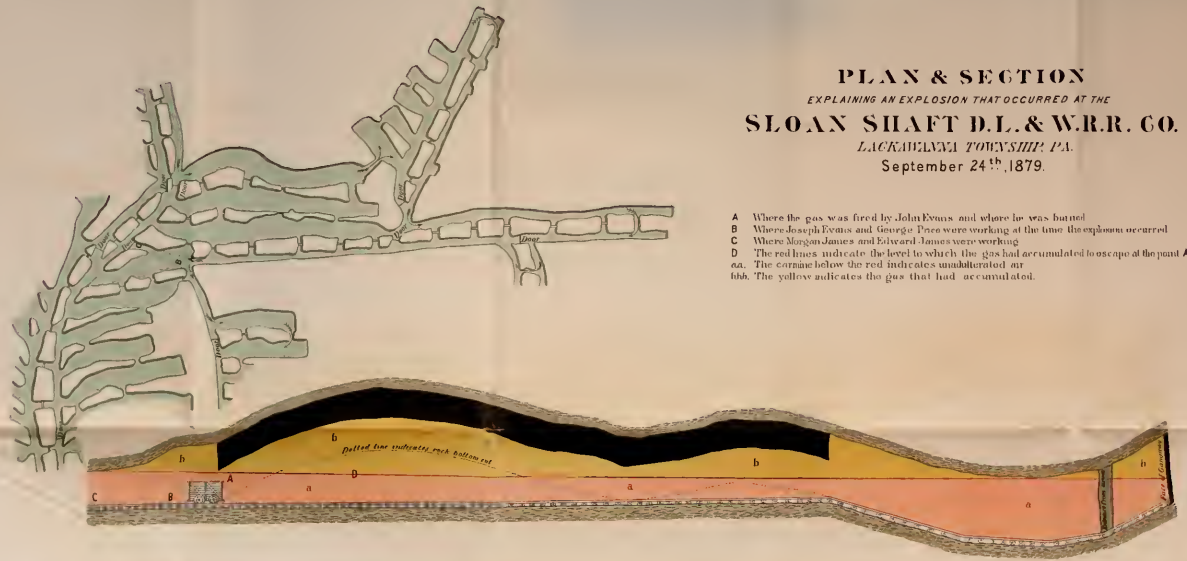
EXPLAINING AN EXPLOSION THAT OCCURRED AT THE

# SLOAN SHAFT D.L.& W.R.R. CO.

*LACKAWANNA TOWNSHIP PA.*

September 24th, 1879.

A Where the gas was fired by John Evans and where he was burned
B Where Joseph Evans and George Price were working at the time the explosion occurred
C Where Morgan James and Edward James were working
D The red lines indicate the level to which the gas had accumulated to escape at the point A
aa. The carmine below the red indicates unadulterated air
bbb. The yellow indicates the gas that had accumulated.




Scale of Plan 1 inch=112 Ft Section Vertical 1 inch=12 Ft Horizontal 1 inch = 56 Ft

tact with the flame of the outside explosion by the reaction, or it may be by the expansion of the explosion. Both bodies of gas united, and exploded in one unbroken explosion. There was no gas in any of the old workings to escape into the gangway, all had been examined that morning. There are no signs of an explosion having occurred in any of the old chambers, excepting the old chamber of Rees W. Lloyd. The signs there consisted of stoppings blown out, props discharged, gob disturbed, ties thrown about, &c.

"I think it was safe to work men on the main roads in the colliery, even when the fan was not running. In this case, the high roof in the rock cut deceived us; if we had examined this high roof that morning it is probable that we would have found gas there. I do not think it possible for us, or any one else, to comply with the letter of the seventh section of the mine ventilation law, that is to say: 'To provide an adequate amount of pure air to dilute the gas and render it harmless, to such an extent that the entire mine shall be in a fit state for men to work therein.'"

After taking the above testimony, I read it over to Mr. Williams, and gave him an opportunity to correct any errors he might notice in the transcribing, and if he desired to explain or qualify any portion of it, I asked him to do so. He found no errors to correct, but desired to qualify his statement on two points, as follows: Where he says, "the fan was stopped for fifty hours when the explosion occurred," he desired to add 'that the men had been working every day, in Tom Jones' gangway, during the time the fan was not running." And where he says that "he does not think it possible for him or any one else to comply with the letter of the seventh section of the mine ventilation law, &c.," he desired to withdraw that statement, and substitute the following: "Up to the time of the explosion, I believed that the provisions of the seventh section of the act were complied with in this colliery, but the explosion convinced me that they were not."

*Morgan James' Statement.*—"My name is Morgan James. Reside in Bellevue. Am fire boss by occupation. Am employed as fire boss in the Sloan shaft colliery. Was at work on the 24th instant. Came to work about six ten, A. M. I first went through Elias Hughes' gangway, to examine as to gas, then I returned and went up R. W. Lloyd's old chamber, and out through Heycock's chamber to Dando's air-way, which I followed in to the face, thence through an entrance to T. Lewis' gangway, and back, along this gangway, to Gallagher's air-way, and through an entrance near the face of this to the face of Tom Jones' gangway, thence out through Tom Jones' to Jonesie's gangway, and thence into the old workings below Jonesie's gangway and between this and Elias Hughes' gangway, and then through the other sections of the mines. I found gas only in Tom Jones' gangway, in the sections surrounding the one where the explosion occurred, and only in one other place in this vein in the entire mine. I traveled only through the gangways and air-ways. Did not go into the chambers, excepting those on the rise in Jonesie's gangway, and the old chambers

below this, where I sometimes found gas. I was back to the foot of the shaft, after going my rounds, by about seven o'clock, and I then whistled up the shaft for the men to come down. The men then came down and went in to Tom Jones' gangway to their work, while I went in to Mark's gangway, with two miners who were going in for their tools. When I returned, I went in and joined the men in Tom Jones' gangway, and was with them when the explosion occurred. Those present with me were Edward James, John Evans, Joseph Evans, and George Price, all of whom were more or less severely burned and otherwise injured. The gas was fired by John Evans. He was unloading a car of rock at the time, and was standing in the car with his lamp in his hat, and the flame of his lamp came in contact with the gas escaping under the top coal near him. I did not look for gas in the high roof in the rock cut that morning. I believe the gas that exploded was generated in this high place in the rock cut, and I do not believe that it escaped from the other high place near the face of the gangway. Do not know of any feeders in the rock cut that would evolve so large a body of gas. From my knowledge of the colliery, I can say that I did not think it was dangerous for men to work in it when the fan was stopped. I never noticed the air current to reverse when the fan was not running. The mouth of the slope is fifty feet lower than the mouth of the shaft."

After taking down the above testimony of Mr. James, I read it over to him as in the case of Mr. Williams, and he said it was exactly what he had said, and that he did not wish to take anything from it nor add anything to it.

Perhaps it may be asked why I give the statements of these men in this manner, and my answer is, that I think it to be no more than fair to allow them to state their case in their own words, and make such explanations as they desire in their own way. The public is also enabled to see, in part at least, the premises from which I draw my conclusions; and all who desire to draw conclusions for themselves, can do so whether they agree with mine or not.

Now, the facts in the case, summed up briefly, as they appear to me, are as follows: The Sloan shaft colliery at the time of the explosion had been stopped for repairs, and amongst other things in the way of repairs, the old fan was being taken out and to be replaced by a new one. Certain main roads inside needed grading, and the stop was taken advantage of to do this work also, Mr. Williams believing, no doubt, that it could be done with safety. The five men who were injured were sent in to do this work, one of them being the fire boss. These facts are undisputed. And from these, with the kindest feeling towards Mr. Williams, the mine boss, and Mr. James, the fire boss, both of whom are good men, I must say that in my judgment they both erred very much in the case. And I have no hesitation in saying that, under no circumstance whatever, were they justified in allowing men to enter the colliery for the purpose of working when the

fan was not running. It will be observed that Mr. Williams frankly admits that "up to two years ago they considered the colliery to be quite fiery;" and further on he says that "the whole colliery generates gas even now," which, I should say, gives it a character much too "fiery" to risk human life in it when the ventilation is suspended. In 1877, during the strike, when the ventilation was suspended through the fan being stopped for five days, it was well known that the colliery filled with gas; and even on the morning of the explosion it was well known, and admitted by Mr. Williams and Mr. James, that there was "standing gas" in at least two sections of the colliery, one of them being the very gangway into which these men were sent to work with naked lights; and the explosion proved that there was a third very large body of "standing gas," which they knew nothing about, because the section where it lay had not been examined. The mine ventilation act is so plain and explicit on this point that it would seem to be impossible for any one to misconstrue or misunderstand it. The seventh section of the act provides for as much pure air "as circumstances require, which shall be circulated through to the face of each and every working place throughout the entire mine, to dilute and render harmless and expel therefrom the noxious, poisonous gases to such an extent that the entire mine shall be in a fit state to work therein, and be free from danger to the health and lives of the men by reason of said noxious and poisonous gases, and all workings shall be kept clear of standing gas."

Then the eighth section provides that the mine boss, "or his assistants, shall examine carefully the workings of all mines generating gas every morning before the miners enter the coal mine or colliery, and shall ascertain that the mine is free from danger; and the workmen shall not enter the mine until such examination has been made and reported, and the cause of danger, if any exist, be removed."

I think no one will dispute the fact that the above clauses entirely prohibit any person from entering a mine that generates gas until it is provided with sufficient ventilation to dilute the gas as it generates, thus insuring the entire mine to be free from danger. And another fact cannot be disputed, that these wise provisions of the law were almost entirely ignored in this case. An examination of parts of the workings had been made, and gas, in large quantities, had been found in two sections thereof; and a third body of gas is admitted, which was not found, because the section where it had accumulated had not been examined, and five men were sent in there to work, knowing gas to be lodged only a short distance from the place where they were to work. The fact that the number of persons was only *five*, does not justify the act, though it is advanced always as an excuse in cases of this kind, as if the lives of a small number of persons may be endangered at pleasure. The lives of these five men in this case were spared only because the proportion of air and gas were such as made the mixture barely explosive. The explosion was very tame for the quantity of gas there, and had there been the necessary proportion of

air there to bring it near its most explosive point, it would have completely wrecked that section of the colliery, and not one of the men would have escaped with his life.

In justice to John T. Williams, the mine boss, I will add, with great pleasure, that notwithstanding this accident, I consider him to be one of the most intelligent, practical, competent, and faithful mine bosses in my district; and I am very certain that he has learned a lesson in this case that he will profit by as long as he lives.

ACCIDENT No. 126.—Joseph Kendler, a miner at the Twin shaft, Pittston Coal Company, Pittston borough, was severely burned December 9, by an explosion of gas. This explosion occurred in the lower vein, to which they had sunk the shaft a short time previous, and in which only thirteen persons were employed. The explosion occurred at seven, A. M., by Kendler entering the mine before it had been examined, and by his going into another man's gangway, where he ignited the gas himself. Gas is generated very freely in this vein, and yet the general discipline at the time of, and before the explosion, was very loose on the part of all concerned, from the mine boss, William Harrison, down. There was no fire boss employed, Harrison assuming the care of the gas, which he had ample time to attend to, as he had only the men in this vein to look after. He did not attend to his duty properly, as he did not examine the working places in the mornings, before allowing the men to enter the mine, but allowed them to descend the shaft, and enter to their work before such examination was had. The excuse he gave for not complying with the requirements of the law in this respect was, that he "did not think it necessary, because there were only a few persons working there," from which we must infer that he thought it no very great harm, if thirteen persons should lose their lives.

At the point where the gas had accumulated, a canvas brattice had been removed by John Kearns and Michael Fadgen, on the afternoon of the day previous, and which they neglected to replace, as they went home at night. Harrison had ordered them to keep this brattice up all the time, and not to remove it under any circumstance whatever, which Kearns and Fadgen admit, but they did not obey the order. They removed the brattice, went home leaving it down. Gas accumulated in consequence. Harrison neglected to examine the place the next morning. Kendler entered before any one else, exploded the gas, burning himself so severely in the hands, that he will be a partial cripple, probably for the remainder of his life.

Those are the undisputed facts in this case, and they go to show just how accidents happen in the majority of cases from explosions of gas.

#### Deaths from Falls of Roof and Falls of Coal.

There were thirty deaths from the above causes during the year, which is nearly fifty-one per centum of the whole number of fatal accidents for the year.

ACCIDENT No. 3.—Thomas Clarke, a laborer, working for Peter Trence

and Christian Whitney, miners, working in the Pierce colliery, operated by Messrs. Jones, Simpson & Co., Archibald Borough, was instantly killed January 31, by a fall of roof. This accident was the result of inexcusable negligence on the part of the miners in charge of the chamber, and on the part of David H. Jones, the mine boss. The area of the fall was four hundred and eighty-three square feet, and consisted of a clod of rock three inches thick, which overlies the coal, which, at this place, was full of water seams. No attempt should ever have been made to prop this up, but the miners should have been compelled to take it down as they advanced in their excavation. Props would not hold it without having an immense number of them, while the amount of timber standing there was very far from being sufficient.

The mine boss plainly neglected his duty in not compelling the miners to keep their working place in a safe condition. According to his own testimony, he had not visited this chamber for three days before the accident, and he further stated, that he had not examined the roof even at that time. And he also admitted that it was his "custom to go through the chambers every other day, and sometimes only twice a week." He had fifty-three working places under his charge, and I hold that he could not perform his duty properly as required by law, without visiting and examining every working place at least once every day, and I cannot understand what there was to prevent his doing so.

The miners, however, knew that the clod was dangerous. They had just discharged a prop from under it with a blast. They put the prop back in great haste, and went out for more timber, leaving the laborers in the danger; and in about thirty minutes after their going out, the news followed them that Clarke was killed, and Thomas Malone, the other laborer, seriously injured. Malone had realized the danger they were in, and had informed Clarke of it a few minutes before the accident, saying: "Perhaps I can put in this day here, and if I can, it will be my last." Malone had also called the attention of the miners to the dangerous condition of the roof.

Thomas Clarke was of Irish nationality, fifty-eight years of age, and left a widow with six children to mourn his loss; but the children are all full grown.

Following my investigation, an inquest was held by the coroner, E. Travers, M. D., who empaneled the following jury: C. Linde, (foreman,) J. W. Lalley, P. J. Ort, Martin Murray, C. Weller, and Michael Collins. "The jury found, from the evidence adduced, that Thomas Clarke came to his death by accident."

Accident No. 4.—Charles Fletcher, a laborer, working for Christian Codier, at the Capouse shaft, Lackawanna Iron and Coal Company, Hyde Park, was instantly killed February 3, "by a fall of roof immediately after firing a blast." This party were engaged taking a skip off of the rib in a gangway to make it wide enough for a double track for a passing branch. In driving the original gangway, about twenty inches of bony, overlying

the coal, had been left up for roof; but on widening the gangway, it became necessary to take this bony down, and the order of Rees G. Brooks, the mine boss, to C. Codier and the party working cross-shift with him was, "to be sure to take down the bony as they went along, but if they failed to bar it down, then they were ordered to stand temporary props under it." This was admitted by all the parties, but it was not carried out in good faith by any of them.

Where there are two parties working cross-shifts, it is too often the case that where dead work of this kind is required, they will resort to every means to throw the work upon each other, and the indications were that this had been done in this case. One thing is very evident, too large a surface of this bony was hanging at the time of the accident. Immediately after firing a blast, Fletcher rushed in, evidently without heeding where he was going, and was crushed to death by the fall which followed the blast. He was of English nationality, fifty-eight years of age, and left a widow with six children, most of them grown up.

ACCIDENT No. 6.—Patrick Cahan, a laborer, working for Austin Flemming and Patrick Tracy, at the Phœnix shaft, Phœnix Coal Company, Pittston township, was fatally injured, February 20th, by a fall of roof. He reached his home alive, but died about ten o'clock on that night. This was a plain case of willful negligence on the part of the miners, and they were themselves so conscious of their criminality that they soon left for parts unknown, to escape the prosecution they knew they richly deserved.

William Simmers, the mine boss, had been in the chamber about nine o'clock, A. M., that day, and on examining the roof, he found that a clod of rock had parted from the roof proper, and that it was heavy. At that time there were two temporary props standing under it, and as long as these props were standing he considered the place safe. If he had found only one prop under it, he asserted that he would not have considered it safe, and that he would have ordered the miners to take it down, or stand another prop under it, immediately. As it was, to make sure that it would be safe he cautioned the miners, and ordered them to bar it down or stand more timber under it. He also explained the nature of the overhanging clod to them, that it was cut up with water seams, that it was liable to break off short around the props, and that he thought it was dangerous. Mr. Simmers says further: "In my judgement, the miners did not leave their chamber in a safe condition when they went out that day. I blame them for the accident, because of their refusing to re-stand the prop that had been discharged by a blast just before they went out. I would be positive that one of the props must have been discharged had no one told me that such was the case, for I was sure that the fall could not have occurred while both props were standing as I had seen them. The miners were outside, on their way home, when the accident occurred. I saw Austin Flemming passing the office window, where I was sitting, inside of ten minutes before word reached me that the men were injured. I knew the boy that

was killed. Saw him after he was injured. Helped to bring him out. His body was literally crushed to pieces. His back was broken, thigh, leg, and arm fractured, and I have no doubt but he was injured internally."

The testimony of Ephraim Husbet, the surviving laborer, is so explicit that I cannot do better than insert it, and it is as follows: "I was working in the Phœnix colliery, on the 20th instant, for Austin Flemming and Patrick Tracy. Was at work in their chamber when the roof fell which killed Patrick Cahan. Was slightly injured myself by the same fall. Was in when Mr. Simmers was there in the morning. Heard him ask the miners how the roof was, and heard him order one of the miners—Patriek Tracy, I think—to sound the roof, and then he ordered them to be careful of it. There were two props standing under the clod when Mr. Simmers was there. Only one of them was standing when the roof fell. The other had been knocked out by a shot fired in the entrance on the right hand side of the chamber, by Patrick Tracy. It was knocked out about a half an hour before the roof fell. As the miners were about to go home, I asked Patrick Tracy if he was not going to put that prop up again, and he answered "No, you be careful of it and watch it." I also told Flemming that I thought the roof was dangerous, and the answer I received from him was: "You are far enough out of the way if it does come down." He did not tell me not to go under it, he knew that it was necessary for me to go under the edge of it to do my work. It was also necessary for Cahan to go under it on his side of the car, and he had to go farther under it to do his work than I did. Mr. Flemming only, of the miners, went under it after the prop was discharged, and he only went into the entrance where it was perfectly safe. I would have gone out right after the miners, but I was afraid I would be discharged."

"One day, about a month ago, some of this same stuff fell before. At that time, as I was loading a car, I felt a small piece fall and hit me, and I jumped back out of danger. Flemming, seeing me go back, said to me: "If you don't load that car, somebody else will!" And I replied that the rock above where I stood was dangerous, and that I was afraid of it. He then told me to clear out, that he would load the car himself from where I stood; but I told him that I could stand in danger as long as any one, but that when I *saw* the danger I would get back. We succeeded in loading that car, but before the next car came in the rock fell."

Austin Flemming was also examined, and he did not attempt to deny any of the foregoing facts; and when I asked him if he and Tracy did not go home that afternoon, leaving that roof hanging, with the expectation, and almost certainty, that it would fall before the next morning, he did not dare deny that either. This is the indisputable truth. The miners knew that the whole mass would fall before next morning, and they left the discharged prop out for that purpose, and it is my opinion that they cared very little how soon the crash came after they had left the place. I never succeeded in finding Patrick Tracy, and Flemming also disappeared, or I would have felt it to be my duty to have both arrested.

The area of the fall was two hundred and seventy square feet. The rock above this clod was an excellent roof; and the place, in charge of competent miners, would be absolutely safe. Cahan was a young man, nineteen years of age, of Irish nationality.

ACCIDENT No. 8.—Richard Hughes, a miner at the Taylor shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was fatally injured, March 5, by a fall of top coal. His skull was fractured, but he lived until he was brought to the top of the shaft. The place where this unfortunate man lost his life was so safe that one would naturally suppose that it would be utterly impossible for an accident to happen there. The roof was of the best, and the coal was unusually good and easy to work, so that the miner had any amount of time to detect any danger that might threaten. But it is very often the case that where the miners have most leisure they exercise the least care. Hughes must be numbered among that class. He drew a large layer of top coal upon himself by deliberately undermining it with a pick. No one but himself was to blame for his untimely death. He was of Welsh nationality, forty-three years of age, and left a widow, with six children, in poor circumstances, to mourn his loss.

ACCIDENT No. 10.—James J. Harris, a miner at the No. 2 Diamond shaft, Delaware, Lackawanna and Western Railroad Company, Hyde Park, was instantly killed, March 8, "by a fall of roof, immediately after firing a blast." This chamber, like the one where Richard Hughes was killed, was as safe a place to work in as any one could wish. The only thing that could be any source of danger, consisted of the intervening rock between the bottom and top tiers of coal; but, with proper care, there is no danger from this, as it is taken down easily everywhere, unless it becomes very thick, when it makes a good, safe roof by propping it up. Harris, apparently, was late getting in to his work that morning, and was out of coal; hence, in a terrible hurry. He had a hole partly drilled the day before, which he finished that morning. and in charging it he gave it too much powder, blowing the coal all to loss. He then rushed in to see what execution the blast had done, when a piece of the rock spoken of, six feet long, three feet wide, and eight inches thick, fell on him, killing him on the spot. He was of Welsh nationality, forty-three years of age, and left a widow, with three small children, in poor circumstances, to mourn his untimely end.

ACCIDENT No. 11.—Walter Smiles, a miner at the No. 10 shaft, Pennsylvania Coal Company, Hughestown borough, was almost instantly killed March 15, by a fall of coal. He was engaged in taking a skip off an old airway, and had undermined a large piece of coal, and was just in the act of getting under it, intending to mine it further, when about three tons of coal fell on him, crushing him so that he died in a few minutes. His son was working with him, and he said that his father examined the coal by sounding it, before he went under it. For myself, I cannot believe it possible that a proper examination was made, for if such had been the case, it could

not have failed to show that the coal was very heavy, and I am forced to the conclusion that no thorough examination was made, or that the old man took the risk, knowing it to be dangerous. Smiles was of English nationality, fifty-eight years of age, and left a widow, with eight children, but they are nearly all full grown.

Accident No. 12.—Samuel Monk, a miner at the Everhart colliery, T. Waddell & Co., Jenkins township, was fatally injured March 28, by a fall of roof. He was engaged in robbing pillars. A fall of roof had taken place close to where he was working, and there was still a small quantity hanging, and running out to a point which he had not noticed. He was working under this when it fell on him, fracturing a leg. His injuries did not seem serious at the time, but, to the great surprise of everybody, they finally resulted in his death, which occurred April 14. He was of English nationality, forty-eight years of age, and left a widow, with six children, in poor circumstances.

Accident No. 13.—Martin Casey, a miner at the Capouse shaft, Lackawanna Iron and Coal Company, Hyde Park, was instantly killed April 4, "by a fall of bony coal immediately after firing a blast." The chamber, where this accident occurred, was ten yards wide, and the bony coal, fourteen inches thick, was hanging for seven feet, from the face clear across the chamber, covering a surface of two hundred and ten square feet, without anything under it to hold it up. The size of that which fell was two yards square, and eight inches thick. There was a slant or slip running up through this stuff on the left side of the road, which gave it a loose end, and it seems impossible to believe that Casey did not know of this. Too much of this bony was left hanging, and should have been taken down, and could have been taken down easily. It did not appear, however, that the least attempt had been made to make the place safe, though it was very evident that Casey, at least, suspected the place to be dangerous, for he had asked the opinion of a neighbor in relation to the matter that morning. It does not seem possible that such a question should be thought of, unless the inquirer suspected danger, and yet he went on working and fired a blast to make it still worse. After the blast he rushed in, still without examining the roof, and commenced mining out the coal left by the blast, when his recklessness ended in his death. I found a three by five inch wooden mine rail standing under the bony when I was there, but that had been put in after the accident, by the men who drew out the lifeless body from under the fall.

Coroner E. Traverse put in an appearance, but did not hold an inquest, as there was not the least doubt but the unfortunate man was the victim of his own carelessness and negligence. He was of Irish nationality, thirty years of age, and left a widow, but no children, to mourn his loss.

Accident No. 14.—John Stanton, a laborer, working for Festy Davan, at the Greenwood colliery, Pennsylvania Anthracite Coal Company, Lackawanna township, was instantly killed April 4, by a fall of roof. The coal

in the chamber where this accident occurred, was only three and a half feet thick, hence it was necessary to blast down the top, to make height enough for the mules and cars. The strata thus taken down, consisted of rock, from one to two feet thick, over which there was a bench of bony coal of about the same thickness. The rock was only taken down over the track, and was to be propped up over the rest of the chamber, and this was what fell on Stanton, fracturing his skull, crushing in his chest in the region of the heart, and breaking his back.

From the general appearance of the chamber, it was very evident that Davan was a very careless and reckless miner. The timbering was sadly neglected, and what there was of it, was miserably done, and I have no hesitation in declaring that he was responsible for Stanton's death. Such men should never be intrusted with the charge of a chamber, for they are not competent to take care of their own lives, without considering the lives of others. Stanton was of Irish nationality, thirty-seven years of age, and left a widow, with two small children, in extreme poverty, to mourn his loss.

ACCIDENT No. 18.—John Barrett, a miner at No. 2 slope, (Port Griffith,) Pennsylvania Coal Company, Jenkins township, was instantly killed April 29, by a fall of "black rock." The rock which fell, was twelve feet long, by an average width of three and a half feet, and an average thickness of eleven inches. Barrett was rapping in an entrance under the rock, when it fell, to ascertain the distance yet to drive through the pillar, while Patrick Pace, his partner, was on the opposite side of the pillar.

The order of the mine boss to these miners was, that they must keep this rock down close to the face, and in no case to let it hang back over the chamber, but this order had been entirely ignored. Patrick Pace said: "We intended to put a hole above it, to blast it down after firing another blast in the coal under it." This is the same old excuse that we so often hear for these accidents. The all-important thing to do, is put off until something else is done which is of no importance whatever. There is no doubt in my mind, but both these miners were to blame in this case, and I think the surviving miner should have been discharged, for if men persistently refuse to obey orders which are intended solely to insure their safety, it is high time to stop them.

It is very probable, from the statements of Michael Hoban and James McLaughlin, the laborers, that Barrett intended to let this rock stand, and to try to prop it up. He had spoken to one of them to that effect a short time before he was killed, but the laborer told him that the mine boss would not allow him to do that. This black rock cannot be held up with props, as it expands, and breaks when exposed to the air, and is never safe only when kept down close to the face.

Barrett was of Irish nationality, thirty-eight years of age, and left a widow, with three small children, to mourn his loss.

ACCIDENT No. 19.—John Parry James, a laborer, working for his step-

father, Henry Parry, at the No. 2 Diamond slope, Delaware, Lackawanna and Western Railroad Company, Hyde Park, was fatally injured May 1, by a fall of top coal. He died in about an hour after being taken home. In the chamber where this accident occurred, an attempt was made to prop up the top coal, which was very badly cut up with irregular slips and slants, so that it was very risky work to attempt it. It was a great mistake to try to timber it. The roof proper, though not extra good, was far safer than the top coal, and with good timbering would be quite safe.

The immediate cause of the accident was that a prop from under a large bowlder of the top coal projecting out from the rib over the road had been discharged by coal flying from a blast. A part of the bowlder fell when the prop was discharged; then another prop was put in under the part still standing; but it was put in too near the rib, hence not under the center of the bowlder. The young man James was loading the coal which fell when the prop was discharged, when the balance of the bowlder discharged the new prop, and fell on him, crushing him so that he died as before stated. It was believed at first that he was not seriously injured; but it soon became evident that his injuries were internal, and that they consisted, apparently, of a rupture of the bowels and serious disarrangement of other internal organs. He suffered principally from difficulty in breathing, and begged most pitifully for relief in this respect, indicating that his respiratory organs were injured very seriously. He made no complaint of any other trouble.

The mine boss, Daniel Phillips, should not have allowed the miner to attempt to prop up that top coal, and the fact of his allowing this to be done plainly shows that he did not supervise the working of the men under his charge, as the law requires. When I told him that the top coal there could not be timbered safely, he readily agreed with me; and when I ordered him to see that it be all taken down, he promised to do so, and did so. But why did he not see the necessity of doing this before the life of a fine young man was sacrificed?

James was of Welsh nationality, twenty years of age.

Accident No. 20.—Frank Shuster, a miner, at the White Oak colliery, Delaware and Hudson Canal Company, Archbald borough, was instantly killed May 8, by a fall of coal. The chamber where this accident occurred was worked by Shuster and Frederick Miller, and was as safe a place to work in as one could wish. The roof was good and the chamber was well timbered. Shuster had just fired a blast in what is known as the "five feet bench," but the blast did not bring out the coal, and he hastened in with his pick, and commenced undermining it. In order to do this, he was obliged to go under what is called the "eighteen inch coal," which proved to be cut through by the blast to a smooth above it. He went under this without examining it, and, after mining for some time, he took his drill and commenced barring out the coal, and in doing so drew down the "eighteen inch" bench upon himself, which killed him instantly. I was informed by Frederick Miller, his partner, that he was in great haste to get home to work

in his garden, but that he was usually a very careful man. However that may be, it is very evident that he lost his life entirely through his own negligence. He was of German nationality, thirty-two years of age, and left a widow with three small children.

ACCIDENT No. 21.—Paul Ward, a miner, at the Stark shaft, Pennsylvania Coal Company, Pleasant Valley borough, was instantly killed, May 10, by a fall of rock. The rock was that between the bottom and top tiers of coal. Ward and Martin Curley, his partner, on entering to their work in the morning, found that they had no coal down. A hole was drilled in great haste, which, when fired, failed to do its work; then Ward took a drill and went under the overhanging rock, without examining it, to drill another hole. But he had not been at this work but a few minutes, when the rock fell on him, crushing him to death. It was believed that his neck was broken.

This is another instance where undue haste proved fatal to life. On being interrogated, Curley admitted that neither he nor Ward had examined the rock that morning. It would not have taken two minutes to do so, and there is not a shadow of doubt but, had they examined it, they would have barred the rock down, and thus would have saved Ward's life. Ward was of Irish nationality, forty years of age, and left a widow, with four children, in poor circumstances, to mourn his untimely death.

ACCIDENT No. 25.—Edward Joyce, a miner at the Sibley shaft, Pennsylvania Anthracite Coal Company, Old Forge township, was instantly killed, July 9, "by a fall of roof, immediately after firing a blast," which discharged a prop. He hurried in to the face, into the midst of the thick smoke made by the blast, and just as he got there the roof fell on him, crushing him to death. The roof in this chamber was not good, and it was very poorly timbered. Frederick Repp, the mine boss, had visited the place about eleven o'clock that morning, and had ordered Joyce to stand another prop on the right of the road, within about ten feet of the face, which he promised to do; but he did not do so, or if he did, then there were two props discharged by the blast. But I do not believe that the prop was put up as ordered, for it was lying just where Repp saw it in the morning. The rock which fell was twelve feet square, or one hundred and forty-four square feet, and in the thickest part it was fully two feet thick. Joyce was of Irish nationality, sixty years of age, and left an aged widow to mourn his loss.

ACCIDENT No. 26.—Stephen Barton, a miner at the Stark shaft, Pennsylvania Coal Company, Pleasant Valley borough, was fatally injured, July 12, by a fall of rock. He died of his injuries, on reaching the top of the shaft, as he was being conveyed to his home. This is another case of inexcusable carelessness and negligence on the part of the unfortunate victim. Patrick Brennan was equally responsible with Barton for the safety of the working place. The rock which fell in this case again was the rock between the top and bottom coals, which can always be easily barred down,

unless it is unusually thick. There is no excuse for men to lose their lives with this rock, and they never do, but through the most stupid carelessness.

Barton was of Irish nationality, thirty-five years of age, and left a widow, with four children, in poor circumstances, to mourn his untimely death.

Accident No. 28.—George W. Beddoe, a miner at the No. 2 Diamond shaft, Delaware, Lackawanna and Western Railroad Company, Hyde Park, was fatally injured, July 18, by a fall of the rock interlying the top and bottom tiers of coal, "immediately after firing a blast." He lived in great agony until the morning of the 20th, when death mercifully released him from his suffering. As before stated, this rock is always to be taken down, but it is often allowed to hang too far out from the face, which, unfortunately, was the case in this instance; and there being a slip running with the chamber near the left hand rib, the rock was cut through by it, which made it very dangerous when allowed to hang. It was quitting time, and Beddoe had just fired his last blast for the day. There was no occasion for his going back into the face after firing the blast; but in his anxiety to see what execution it had done, he ran into the face without thinking to examine the rock, and just as he got there the rock fell on him. It was thought at the time that his injuries would not prove fatal; but on going to see him, he appeared to me to be suffering from internal injuries, which his death proved beyond a doubt was the case. He was a man highly respected by all who knew him, and he was deservedly so, for he was certainly an exemplary young man in every sense, his spotless life being an example worthy of emulation by all men. He was of Welsh nationality, thirty-five years of age, with no family of his own.

Accident No. 31.—John Coleman, a laborer working for Evan B. Williams, and son, Thomas B. Williams, at No. 10 shaft, Pennsylvania Coal Company, Hughestown borough, was almost instantly killed August 11, by a fall of roof. E. B. Williams asserted on the examination, that he had examined the roof only a short time before the accident, and that he did not find anything that he considered dangerous, but I was forced to doubt his statement, for he asserted, with equal positiveness, that the roof was safe, when I was there inquiring as to the cause of the accident. But on examining the roof myself, I found large slabs of what is called "rider coal" hanging loose, which I caused him to take down in my presence. Several props were needed, to make the roof safe near the face, though, as a rule, the chamber was well timbered. I am sorry that I must lay the blame for the accident, in a great measure, on Williams. Coleman was of Irish nationality, fifty-one years of age, and left a widow, with six children.

Accident No. 33.—John McDermott, a miner at the No. 5 shaft, Pennsylvania Coal Company, Jenkins township, was instantly killed August 14, by a fall of "black rock." The roof proper, in this place, could not be better, the only source of danger being the "black rock," which the miners

are ordered to take down close to the face of the coal, and are paid extra by the company for doing so, as I shall explain more fully in another place. The miners had fired a blast under the bowlder that fell, and McDermott went under it with his pick, and was picking out some coal left by the blast, when the rock fell on him, crushing him to death. William Killgallon, one of the laborers, had warned him that the rock was dangerous, but he paid no attention to the warning. There is not a particle of doubt but that, if he had taken a bar and tried to bar it down, it would have come without any trouble. If, however, it would not come down with a bar, he should have put a blast in the rider coal over it, which would not fail to bring it down. It is not safe to allow this "black rock" to hang more than three feet from the face of the coal, as we have learned by a long experience, and the workmen are repeatedly warned of this fact, but still they persist in endangering their lives by utterly disregarding all advice and warnings given them in relation to it. This unfortunate man had been ordered many times not to allow the "black rock" to hang over his head, or over the heads of his helpers, but he refused to obey, and was therefore himself alone responsible for the accident. McDermott was of Irish nationality, thirty-six years of age, and left a widow, with four small children.

ACCIDENT No. 35.—William Burns, a miner at the Green Ridge slope, Green Ridge Coal Company, Dunmore borough, was instantly killed August 28, by a fall of roof. In my inquiry as to the cause of this accident, I was very much surprised to find a blacksmith shop located in the old workings, a short distance from the foot of the slope. It was put there for the purpose of sharpening and repairing the miners' tools, so as to make it unnecessary to carry them outside, and for the purpose of shoeing the mules, &c. There could be no serious objection to this arrangement, provided the shop had been located in a safe place, with a safe traveling way to it, but I am sorry to say that it was not so located. The roof, even, over the blacksmith's forge was heavy and unsafe, and the roof over the traveling-way to and fro was very dangerous. It being the only instance in my whole district where a shop of this kind was located underground, I had never suspected of its being there, hence I had never examined it, or the passages approaching it. The first intimation I had of its being there, was when I visited the place after the accident. Then I found it about twenty yards inside of a pair of doors, through which it was necessary to go in order to get to it. The fall of roof which killed Burns, was on this passage way to the shop, just inside of the said pair of doors, and just fifteen yards from the forge. The surface of the fall was thirty square yards, and its average thickness about fourteen inches. It consisted of shelly rock and bony coal, and it was painfully evident that no care had been taken to secure it properly with timber. Burns had been to the shop, leaving some tools there, and was returning on his way home when he was instantly robbed of his life by this treacherous roof. As there was considerable

feeling manifested in relation to this case, and as an inquisition was held by the coroner, E. Travers, I deem it proper to insert the evidence which was brought out on the inquest, and also the finding of the jury, which are as follows:

**Evidence at Coroner's Inquest in Case of the Death of William Burns.**

Timothy Parfery, *sworn:*

I am mine boss in the Green Ridge slope. Have had charge of the mine for six weeks. Had been into the blacksmith shop a dozen times before the accident, by which William Burns was killed. Saw the blacksmith shop, and thought that all was safe. It is located about two hundred feet from the foot of the slope, in the old workings. I never examined the roof particularly in the vicinity of the blacksmith shop. Just looked at it, but did not sound it. Some of the props were rotten, and were replaced by good ones. That was done after the accident. Put in four props after Burns was killed. I used to know when I was working there before that the roof was good. It was tough, and would stand first rate on props. Thought it was perfectly safe. I do not consider this place a very safe one for a blacksmith shop. Do not know who located it there. I cannot tell how many props were under what fell. Do not know that there were more than two. Think that the fall was about fifteen feet long by about ten feet wide. The fall occurred at a point where two roads branched off. The place was quite wide there. I never heard any one intimate that the place was dangerous.

John Kneiren, *sworn:*

I am a blacksmith, and work at the shop near the foot, in the Green Ridge slope. Have worked there for about two years. Cannot say whether it is a dangerous place or not, as I do not understand such things. Heard a report about two months ago that the place was dangerous. I reported the rumor then to the mine boss, and asked him to have extra props put in. About twenty yards from this fall there was another fall, which occurred about two months ago. That was when I reported to Elias Hughes, who was then mine boss, and that was when I asked for extra props, and he had some put in at that time. I was the first man to work at that shop, and I commenced about two years ago, when the forge was first fixed there. Most of my work consisted in sharpening the miners' tools. Also made irons for branches, and did what shoeing was necessary. I was standing at the fire when the roof fell. Ran over to the fall, and saw lots of rock down. Lifted some of the rock, and found William Burns under it, and I thought he was dead. I passed under the roof that fell sometimes a half a dozen times a day, and always twice a day. Do not think there were any props there at the time of the fall.

Michael Rolls, *sworn:*

I work in the Green Ridge slope. Was near the shop when the fall occurred which killed Burns. Heard the fall and I halloed. Then I went down to the fall with the blacksmith, and saw piles of rock down. Helped

take the rock off from Burns. Did not take hold of him. Think he was dead when I saw him. Have worked there two weeks.

J. CALOWAY, *sworn:*

I work in the Green Ridge slope, on repairs. Was near William Burns when he was killed. Was about three yards from him, and was passing out ahead of him. When I heard the roof falling, I jumped ahead and got between the two doors that are just outside the fall. My business called me to the shop several times a day. The collars are all there now except one. I never heard any one say that the place was dangerous.

WILLIAM S. JONES, *sworn:*

I am the inspector of coal mines for this district. Was in the Green Ridge slope, September 1, and examined the place where William Burns was killed. I found a blacksmith shop there, located in the old workings in the upper vein, a short distance from the foot of the slope. On the way to the shop, there are a pair of doors, and the shop is about twenty yards inside of these doors, and fifteen yards inside of the inner edge of the fall, the fall being just inside of the doors. The area of the fall was thirty square yards, and consisted of shelly rock and bony coal, from twelve to fourteen inches thick. It did not appear to me that there were more than two props of any kind under the mass that fell. One of the props was broken in two, and was rotten clear through. Just inside of the fall, I noticed several additional props newly put in since the fall. The putting in of these props plainly indicates that, on examination, the mine boss did not think the place safe. I examined the roof all around the blacksmith's forge, and came upon the other fall spoken of by the blacksmith. I found several places where the roof was heavy. The roof right over the blacksmith's fire was heavy. After examining the place thoroughly, I came to the conclusion that it was not a safe and proper place for men to work in, and that it was especially a bad place for a blacksmith shop, because nearly every man in the mines must go in there daily with, and for their tools. On returning to the surface, I called the attention of O. S. Johnson, esquire, to these facts, and ordered him to have the shop removed, which he promised to do. I never knew until after this accident, that there was such a thing as a blacksmith shop in this place, and I never would think of looking for one down in the mines, especially in the old abandoned workings. There is no other one to my knowledge, in my whole district.

E. TRAVERSE, M. D., *sworn:*

I am coronor of Lackawanna county. Examined the body of William Burns, and found a fracture of the skull just above the left eye. I considered that sufficient cause for instant death, and therefore I made no further examination. The fracture of the skull was caused by a piece of rock, or some blunt instrument.

**Verdict of the Coroner's Jury.**

"The jury do say, that the immediate cause of the death of William Burns, was a certain fall of rock in the mines known as the Green Ridge slope, and

the jury do further find from the evidence adduced, that the place where William Burns met his death was unsafe, and, therefore, that the superintendent and mine boss were negligent in their duty, in not propping and fixing the mines so as to insure the safety of the men." (Signed by the jury.)

Accident No. 36.—Thomas D. Morgans, a miner, at the Mt. Pleasant slope, W. T. Smith, esquire, Hyde Park, was instantly killed August 29, by a fall of rock. This is another case where it may be said that no accident need ever occur, and never could occur, only through the most inexcusable recklessness. The chamber was being driven in the bottom tier of coal in the big vein, having the top coal for a roof; and it is impossible to find better roof than this top coal makes when it is not broken or cut up with slips and slants. The rock which fell in this case again was that underlying the top coal. Morgans knew that it was hanging, and his laborer had called his attention to its dangerous condition, even the day before the accident. The laborer had refused to go under it, and he advised Morgans not to venture there, but Morgans answered: "It is safe enough, I could sleep under it until Christmas!" Ah! How little he thought when saying this, that he was destined to sleep the long last sleep of death under it. In a few minutes after making the above foolish remark he went under it, and it fell on him, crushing him to death on the instant. There are many like this poor man, who seem to think that they manifest great bravery when running into unnecessary danger in this manner, and so long as men will be so foolhardy, we must continue to report these fatalities. It cannot be denied but this man was his own destroyer. No one else was in the least to blame for his death. An inquest was held by Coroner E. Traverse, and a verdict was rendered in accordance with the above facts.

Morgans was of Welsh nationality, twenty-six years of age, but left no family, having buried his wife and child some time before his own death.

Accident No. 37.—Patrick Docherty, a miner at the Grassy Island shaft, Delaware and Hudson Canal Company, Olyphant borough, was fatally injured September 4, by a fall of top coal. None of his bones were fractured, but he was injured internally, and died on the 7th. He had just fired a blast in the top coal, and had gone into the face to bar down some loose coal left by the blast. John Flemming and Michael Langan, the laborers, judging that the coal was dangerous where he stood, warned him of the fact, and advised him to get a "horse" and bar the coal down from the outer edge; but instead of heeding this warning, he went on in his own way and barred the coal down upon himself, with the result already stated. The chamber was perfectly safe, and no accident need ever occur in it if ordinary care were exercised in working it. But the majority of accidents occur in just such a safe place as this was.

Docherty was of Irish nationality, forty-five years of age, and left a widow, with three children, to mourn his loss.

Accident No. 38.—Patrick Kelly, a laborer, working for John Rutledge and his nephew of the same name, at the No. 10 shaft, Pennsylvania Coal

Company, Hughestown borough, was fatally injured, September 15, by a fall of top coal. The accident occurred in the morning, and Kelly died in the afternoon of the same day. The chamber in which this occurred was just being opened on a sharp pitch; but it was not opened to its full width. It was as safe a place to work as could be desired. The true cause of this accident was plainly revealed in the testimony of the elder Rutledge, as brought out in the investigation, the most important part of which is as follows:

"I and my nephew are the miners in charge of the chamber where Patrick Kelley was killed. We went home about noon on Saturday, and when I got to work about seven o'clock on Monday morning, there was not much coal loose in the chamber. The first thing I did was to drill a hole and fire it, in the bottom bench. Then I drilled and fired a hole in the top coal, on the lower rib, and then I barred down what coal I thought was loose. Cannot say that I barred it all down. Must admit that I did not, but I thought I had. I did nothing to assure myself that I had barred all down that was loose. I then went to work drilling another hole in the top coal, on the upper rib. Was drilling this hole when the coal fell on Kelly. This occurred in about fifteen minutes after I had been barring the coal—it might be more, or it might be less. It is probable that the drilling of the hole on the upper rib was sufficient to jar the coal down; if it was, the coal must have been quite loose."

Patrick Judge, the surviving laborer, amongst other things, testified as follows:

"There was not over a half car of coal down yesterday (Monday) morning when we went in to our work, and we were following the miner very closely up to the time when the accident happened. The miners went home Saturday, leaving the chamber a little before noon. They had probably reached the head of the shaft by noon. The younger Rutledge was not at work on Monday."

Now, there can be no doubt but this sad accident was occasioned in the manner following: The miners went home too early the Saturday previous, not leaving coal enough down to have any left for the following Monday morning. When Monday morning came, the elder Rutledge was the only miner who went to work, the other having remained at home, as it was alleged, to attend to some business. When the elder Rutledge reached his chamber about seven o'clock Monday morning, he found that there was not a car of coal loose to commence the day's work, and, in great haste, he drilled a hole and fired a blast in the bottom bench. This did not produce much coal, however, and, his excitement increasing, he hurried to drill another hole in the top coal, on the lower rib, which he charged and fired. This blast loosened a certain quantity of coal that did not fall with the blast, and the miner took his drill and barred some of it down; but he was still in too much haste to bar it all down, for his laborers were loading the coal fully as fast as he could furnish it; hence, he did not take time to bar

down all that was loose, nor do anything to assure himself that there were no dangerous pieces still hanging. Instead of doing this, he commenced to drill still another hole in the top coal, on the upper rib, and the jar caused by this drilling brought down about five hundred weight of coal, which fell on Kelly, causing his death.

Nothing had been touched in the chamber since the accident, when I visited it the following morning. And on examining the place, I found considerable coal still hanging loose, which I caused Rutledge to bar down in my presence. He barred down enough to kill a half dozen more men very easy, and there was still more to come, which I ordered them to bar down carefully before work should be resumed there. I am painfully convinced that many of our accidents result from the terrible haste to get home early, and consequent hurry and excitement the following morning, arising from fear of losing cars, for the want of coal to load them. This accident was undoubtedly one of that class, and No. 10 and No. 20 in the list for this year are other instances.

When I warn the miners against this dangerous practice they get angry, and assert that I want them to remain in the mines all the time, and that I am not willing for them to have any time for themselves. I am not opposed to their having the privilege of going home when they can do so with safety to themselves and their laborers. But I cannot assent to their right to do so, where they do not keep their work well in hand, and keep their working-places safe, so as to avoid this fatal hurry and excitement that invariably follows. And if miners persist in the practice, as many do, then they ought not to be allowed to have charge of a chamber. Patrick Kelly was of Irish nationality, fifty-three years of age, and left a widow, with six children, mostly grown up, to mourn his loss.

Accident No. 39.—Michael McDermott, a miner at the Jermyn shaft, John Jermyn, esquire, Jermyn borough, was instantly killed September 15, by a fall of coal and bony. The chamber was worked by McDermott and Andrew Flanigan, and it was forty feet wide at the point where the accident occurred, and the fall consisted of about two tons of coal and "buck." At this point an entrance, eighteen feet wide, had been made into an old air-way, which widened the chamber to a total width of fifty feet. This was at least fourteen feet too wide, and the mine boss should not have allowed it.

McDermott had fired a blast on the Saturday evening previous, in the "fourteen inch" bench of coal over the "buck," which, however, failed to bring it out. Then on Monday morning he fired a blast in the bottom coal, and this again only shattered the coal, but did not displace it. He then went to mine out this bottom coal under the "fourteen inch" and "buck," that had been made loose by the blast on Saturday, and the whole mass fell on him, fracturing his skull and killing him instantly. He had repeatedly been warned of his danger by his partner, but he answered, "never fear, there is no danger yet awhile," and went on mining under it,

until he finally drew it down upon himself. When men deliberately go under dangerous coal or roof in this manner, and recklessly draw it down upon themselves, there is nothing that can be done, as I see, to save their lives. Michael McDermott was of Irish nationality, forty years of age, and left a widow, with four children, to mourn his loss.

ACCIDENT No. 40.—John Reiley, a miner at the No. 2 slope, (Port Griffith,) Pennsylvania Coal Company, Jenkins township, was fatally injured, September 24, by a fall of "black rock." He died of his injuries on the 2d of October. The miners in this case again knew that the rock was dangerous. Henry Jopling, the mine boss, had passed through the chamber about an hour before the accident, and as he was about to pass through the entrance at the face into the adjoining chamber, Reiley warned him not to go that way as there was a dangerous piece of black rock hanging there. On learning this, Jopling ordered him to take it down at once, and he promised to do so; but there was a pile of clean coal in the entrance which Reiley wanted to move away before taking down the rock, therefore he did not comply with the order of the boss at once. He stopped the laborer to go in there to move away the coal, because he considered the place too dangerous; but he ventured there himself, and was shoveling away that coal when the rock fell on him, inflicting injuries from which he died in eight days, as before stated. He showed great care for the safety of others, which was very commendable in him, but he deliberately went into known danger himself, which was very little, if any, better than voluntary suicide. When will men cease taking these fearful risks? And when shall we have such discipline in our coal mines as will insure prompt and implicit obedience to all orders given by the mine bosses? If the order of the mine boss in this case had been promptly obeyed, Reiley's life would not have been sacrificed. I believe, however, that the mine bosses are more responsible for this loose discipline than any one else, because they refuse to exercise their authority to enforce obedience to their orders. John Reiley was of Irish nationality, twenty-five years of age, unmarried.

ACCIDENT No. 45.—George Wallace, a driver at the Powder Mill shaft, Spring Brook colliery, Hillside Coal and Iron Company, Lackawanna township, was instantly killed, October 4, by a fall of roof. On examination, I found that this fatal fall of roof occurred fifty-three feet back from the face, in a chamber worked by Michael Haley and Thomas Ruddy, and that it was ten feet long by five and a half feet wide, and an average of about two feet thick. It consisted of the strata of rock interlying the bottom and top tiers of coal. It was reported to me as being a "bell," but it was not. The rock was cut through to the top coal, however, on the right hand side of the road by a face slip, which run for ten feet from a loose end, and then the slip turned sharp right across the road, so that the rock had nothing to hold it up but its own strength on the left side of the road. The inner end had been cut through to the top coal by blasting to make height enough for the mules and cars to pass. It was very evident

that Joseph D. Davies, the mine boss, and Michael Haley, the miner, knew that the roof at this point was not as safe as it should have been. Davies said that he had examined it five or six times on as many different days during the two weeks it was allowed to hang there; and Haley said that he examined it at least twice every day during the same time, and that he examined it some days many times. Now, I cannot believe that either of them would have gone to the trouble of examining this particular point so often if they did not seriously think it to be unsafe. But rather than to take it down, they preferred to take the fearful risk of its falling; and unfortunately it did fall, crushing the life out of a fine young man, and killing a mule for the company. I do not say that it was known that the rock would fall, and kill some one, but I do say, without any qualification, that an experienced man like Davies must have known that it was liable to fall at any time, and that he erred greatly in not ordering it taken down. George Wallace was of Irish nationality, eighteen years of age, and had the reputation of being a very excellent young man.

Accident No. 46.—William B. Williams, a miner at the Continental shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was instantly killed October 20, by a fall of top coal and roof. He was engaged, with Richard Davies and Benjamin Griffiths, taking down the top bench of coal, which was one foot thick—and a clod of rock eight inches thick—for the purpose of making height enough for cars and mules to pass, after raising the track at that point to a level. The gangway, in which this work was being done, was eleven feet and a half wide. At least, three blasts had been fired in this top bench, along the lower rib, breaking the coal down along said rib for ten feet. Then a blast had been fired in it on the upper rib, which, however, did not bring the mass down; but this last blast shattered it so that it soon fell, with the result stated When it fell, Williams was engaged lifting the track under its center, which he persisted in doing, notwithstanding he was earnestly advised by Davies to let the track alone, as that work belonged to the track-layers. If he had followed this advice, he would not have lost his life; but he said he wished to lift the track, so as to fill under it with the clod of rock when it fell, and thus save the trouble of loading it. Thus it is again and again—men will risk their lives, and lose them, in the vain effort to save themselves a little extra work! The coal first fell on him, and knocked him down, pinning his leg fast under a piece of "T iron rail," which he was using as a lever to lift the track. If the rock had not followed the coal so quickly, his life might have been saved. It was the rock that killed him, fracturing his skull. Benjamin Griffiths also had a very narrow escape, his foot being caught fast by the coal, but he succeeded in drawing his foot out of his boot, and thus escaped with only slight injury. William B. Williams was of Welsh nationality, thirty-four years of age, and left a widow, with five small children, in destitute circumstances, to mourn his sad end.

Accident No. 48.—John Parry, a miner at the Bellevue slope, Delaware,

Lackawanna and Western Railroad Company, Lackawanna township, was instantly killed October 29, by a fall of roof. The regular roof in this place was excellent, but there was a bench of bony coal overlying the coal, and next to the rock, which was nine inches thick; and in most places this parts readily from the roof, and, in all such cases, it is taken down. No attempt is made to prop it, unless it sticks fast to the rock, as it sometimes does. In this case, the bony did not stick, but it was allowed to hang across the whole width of the chamber, for eight yards back from the face, with only a single piece of wooden mine rail, three by five inches, under it to hold its weight. This rail was within about two yards of the outside edge of the bony. Parry and his laborer had come to the conclusion that it was no longer safe to work under it, and had determined to let it down; and as nothing was necessary to accomplish that but to take out the mine rail prop, Parry proceeded to knock that out. Finding that he could not knock it way, he got an ax to cut it away, and a single blow, with the fearful weight resting upon it, was enough to sever it, and the whole mass fell instantly, crushing Parry to death. In order to reach the rail, he was obliged to go under the bony. His laborer, James Gallagher, was standing close by, who, seeing him running such a fearful risk of losing his life, advised him to stand another temporary prop nearer the edge of the bony, so that he might be safe while chopping away the rail; but he refused to follow this advice, notwithstanding it was the only proper and safe thing to do, and, like many others before him, and many more to follow, he paid the penalty of his foolhardy recklessness with his life. I cannot let the case pass, without entering an earnest protest against the practice of allowing bony, rock, or coal to hang so far back from the face. The area of the fall in this case was fifty-eight square yards, and, with the kindest of feelings towards G. M. Williams, who is usually a very careful mine boss, I am forced to say that he should not have allowed this bony to hang back so far in this case. An inquest was held, and the jury found that "John Parry came to his death by an accident in the Bellevue slope, by his own carelessness." John Parry was of Welsh nationality, forty years of age, and left two children, who are truly orphans, their mother having died some time before.

ACCIDENT No. 52.—Patrick Ketrick, a miner at the Marvine shaft, Delaware and Hudson Canal Company, Providence, was killed November 12, by a fall of roof. This accident happened late in the afternoon, after nearly all of the men working near him had gone home, and it is believed that, if the man had received assistance within a reasonable time, his life might have been saved, for he was, apparently, in such a position under the fallen rock that he was smothered. He did not seem to be fatally injured in any other manner. When the rock first fell on him, he could speak, and, as James Clancy, his laborer, tried to lift the rock, Ketrick told him to go for help. Clancy went for help, but could find no one; hence, he returned again to the imprisoned man, who he found still alive. He informed him

that the men had all gone home. Ketrick again told him to go for help, as he could do nothing alone, and he went away the second time, and this time found four men, with whom he hastened back; but by this time the man was dead. These men testify that they could not lift the rock, and that they were obliged to send for more help still, this time going to the foot of the shaft, where J. V. Birtley, the mine boss, and others were found, who ran in, and got the man from under the rock, who was by this time dead beyond all doubt. I was astonished to hear five strong men assert their inability to lift that bowlder, for I am positive that two cool-headed men, by using levers, could have lifted it with ease in a few seconds; but it did not seem that a lever was once thought of by these men, and their attempt to lift the stone was by hand.

The roof over about one half the width of the chamber consisted of rock of a fireclay nature, cut up with irregular slants and seams, requiring extra good timbering to make it safe. But the timbering was very bad, plainly indicating that Ketrick was not a competent miner to work under such roof. He had been ordered not to work any more in the face of the chamber, but to devote his whole time to drive an entrance through the pillar to the adjoining chamber; but he disobeyed this order, and thereby lost his life.

An inquisition was held on his death by the coroner, and the following verdict was rendered: "The jury do say that Patrick Ketrick came to his death accidentally, in the Marvine shaft, by a fall of roof, called 'fireclay rock;' and the jury agree that, according to the evidence, the propping was generally bad."

Patrick Ketrick was of Irish nationality, thirty-four years of age, and left a widow, with three children.

Accident No. 54.—David Owens, a miner at the Brisbin shaft, Delaware, Lackawanna and Western Railroad Company, Providence, was fatally injured, December 1, by a fall of bony coal. His injuries were not considered serious at the time, for when the bony was lifted from him by James Riley, his laborer, he got out from under it himself. He complained some of pain in his hip and back, but talked rational and cheerful while he was being conveyed to his home, and no one suspected his injuries to be dangerous, but, to the surprise of all, he died on December 4. It seemed that he was injured in the region of the kidney and bladder, and that his urinary passage was obstructed; and it was said that he did not receive the proper medical treatment for this trouble, and that this was the real cause of his death. It was certainly strange that the man should die from the amount of injury he received.

This working place again was as safe as could be desired; the roof was good, and unusually well timbered; and Owens brought the accident upon himself through the most unaccountable carelessness, though he bore the reputation of being a very careful and competent miner. He ventured under the overhanging bony, which fell on him, to work out some coal

shattered by a blast, without any thought of examining it, which no man should ever do. Every miner in my district has been many times warned against doing this foolish and extremely dangerous thing. They have been warned that they should never enter under overhanging rock, slate, bony, or coal, without examining it carefully before doing so; and they have been repeatedly informed that a large number annually lose their lives by disregarding this advice, and it seems passing strange that they pay no attention to it. They act as if they care nothing for any advice that is given them, and go on year after year as heedless as ever. This practice of mining out stubbs of blasts is one of the most dangerous and fatal practices that our miners are subject to. By reading over this list for last year, it will be found that about a dozen lives were lost from this cause. David Owens was of Welsh nationality, forty years of age, and left only a widow.

ACCIDENT No. 58.—David Laird, a miner at the No. 4 shaft, Pennsylvania Coal Company, Jenkins township, was killed, December 20, by a fall of roof. On the Thursday evening previous, Laird and John Mitchell, his partner, had fired two blasts in a bench of top coal, which they were taking down in a gangway, which had been driven some time before. After firing the blasts they found, on examination, that a part of the roof was heavy, but they went home leaving it as it was. The next day there was no work at the colliery, and when they went in on Saturday morning they paid no heed to the condition of the roof, but went to work barring down some of the coal, standing in the meantime right under the roof, which they had found heavy on Thursday evening; and just as they commenced barring, the rock fell, killing Laird and seriously injuring Mitchell. No one is responsible for this accident but those unfortunate men themselves. Each of them knew the rock was heavy, and yet they paid no attention to it, but drew it down upon themselves by barring down the only very weak support it had. David Laird was of Scotch nationality, twenty-eight years of age, and left a widow, with two small children.

#### Deaths from Falling Down Shafts.

There were three lives lost through falling down shafts during the year, which is five per centum of the whole number of deaths on the list. Every accident of this nature was fatal, as might be expected.

ACCIDENT No. 7.—Joseph Cox, a sinker, at the Hillside colliery, Hillside Coal and Iron Company, Pleasant Valley borough, was instantly killed, March 5, by falling down an air-shaft, which he was sinking. He was being hoisted up the shaft in a bucket, which was two feet in diameter, had reached the top, and when in the act of stepping off on to the landing, his foot slipped, and he was pitched headlong to the bottom of the shaft, a distance of seventy feet, and was killed instantly. It was very evident, that the bucket had been hoisted too high, so that its bottom was considerably above the landing, and hence, when he was stepping off, as he was standing on the edge of the bucket, it went away from him, causing him to slip, and fall.

The mode of hoisting was by horse power, but without a drum. Two horses were used drawing the rope through tackle. The team was said to be very steady, and the driver very careful. Still, this arrangement for hoisting was a miserable affair altogether, and it was no credit to the engineering skill of the manager in charge. The arrangements were very objectionable, when we bear in mind, that it must be used so much for hoisting and lowering men. There did not seem to be any understanding between the young man on the landing, and the driver in charge of the horses. The latter had to judge of the time to stop himself, when the bucket was at the top, though he would be seventy feet away from the landing, but he asserted that he could judge when to stop when that distance away, as well as the man at the landing, which no one will believe.

An inquisition was instituted by P. Durkin, J. P., of Pleasant Valley, but I have not been able to learn what the verdict of the jury was, as the acting coroner refused to furnish a copy. But this is of no great importance, however, for the probability is, that the usual verdict was found: "That Joseph Cox came to his death by accident." That is about the usual result of a coroner's inquest in this region.

Joseph Cox was of English nationality, forty-eight years of age, and left a widow, with three children.

Accident No. 22.—Clarence Robertson, a miner, at the No. 12 shaft, Pennsylvania Coal Company, Pleasant Valley borough, was instantly killed, May 16, by falling off the carriage, as he, with a number of other men, was being hoisted up the shaft. The carriage was near the top, when, as it was believed, Robertson was overtaken by a fainting fit of some kind, causing him to fall. Being at the end of the carriage, he fell against the side of the shaft, which was so uneven as to leave large holes, through one of which he fell past the carriage to the bottom. The shaft is not lined as all shafts should be, hence it was easy for him to fall through.

The cause of the man's fainting cannot be satisfactorily explained. One theory advanced to account for it was, that Robertson, while waiting at the foot of the shaft was sitting on a bench, and that a drill which was standing against the rib near him, fell by some means or other, the bit striking him, and cutting him slightly on his head, near the right ear. It was believed by many that this blow had affected his head, bringing on the dizziness that caused him to fall. He made no complaint of the blow at all, nor could I learn that he made any complaint. I am not satisfied that this theory accounts for the accident.

Clarence Robertson was of Scotch nationality, thirty-eight years of age, and left a widow, with four small children.

Accident No. 27.—John Kearney, a slate picker, thirteen years of age, working at the Sloan shaft breaker, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was instantly killed, July 18, by falling from the top to the bottom of the shaft, a depth of three hundred and ninety-three feet.

This accident occurred during the dinner hour, when the breaker and shaft were idle. It is not known how the boy got into the shaft, nor is it positively known what point he fell from. A number of boys testified that they saw him, in company with another boy, Anthony Heermans, a very short time before the accident, near the surface landing of the shaft; but Heermans denied having seen him at all during that noon hour; and if Heermans can be believed, it is not known that any one saw Kearney fall. I believe, however, that Heermans knows more about it than he would admit. His excitable manner and extreme hesitation in answering questions put to him on the examination, and his repeated and uncalled for protestations that he "did not push Johnnie into the shaft," went far to shake my confidence in his truthfulness.

There were two points from which it was possible for the boy to fall in. One was the surface landing. But there were doors completely inclosing this point, which were always kept closed, and they were undoubtedly closed at this time, and if the boy fell in here, he must have opened one of these doors himself. The hoisting carriage was standing level with the landing on one side of the shaft, while the carriage on the other side was suspended in the shaft, near the bottom. There was a separate door for each hoisting way, and from the testimony of the boys around the place, including one David Evans, an oiler at the bottom of the shaft, it is known that Kearney saw the latter open the door leading to the carriage and place some stretchers on the carriage. And the probability is that Heermans and Kearney were playing together, and that Kearney was trying to get away from Heermans, and in doing so ran towards these doors and opened the wrong one, and instead of running on to the carriage, he ran into the vacuum on the other side, and went down the shaft. The only apparent objection to this theory is that the boy struck the bottom of the shaft in the hoisting way under the carriage at the landing. But that objection is easily explained by supposing that he fell as stated, striking the bonnet of the carriage suspended near the bottom, and that his body bounded thence to the side where it was found.

The other point from which it was possible for him to fall, was in a drift driven into the shaft from the level of the railroad track, under the breaker. But from all the information I could gather, it would not seem possible for him to go the distance necessary for him to reach the shaft at this point, in the time that intervened since he was last seen playing with Heermans and the discovery of his fatal fall. No one saw him near the mouth of the drift, and there was no sign of his having been there. It is my conviction that he fell from the first place mentioned, whether he fell in the manner described or not. And I feel very certain that Anthony Heermans could dissipate every doubt, if he could be induced to reveal what he knows about it.

**Deaths from being Crushed by Mine Cars.**

The number of deaths from being crushed by mine cars during the year was ten, making nearly seventeen per centum of the whole number. There are several causes for this fearful loss of life with mine cars, which I will notice in another place, and I will only remark here, that with proper care they ought to be almost entirely averted.

Accident No. 2.—Orlando James, a laborer at the Green Ridge slope, Green Ridge Coal Company, Dunmore borough, was fatally injured, January 13, by being crushed between a car and a prop on an inside slope. He was about one hundred yards from his own chamber when he was injured. Having his car loaded, as the laborers too often do, he went in search of the driver or runner to take the car out; and when he reached the side of the slope he found the runner gathering a trip on the slope who was letting a car down to be coupled on to another to make up the trip; and as the cars were near together, the runner told James to couple them, and as he took a position to obey the order, the car came down upon him, the latch of the car door catching him in the region of the bowels, and crushing him against a prop. It was at first thought that his injuries were only slight, but it soon became apparent that he had suffered a fatal rupture of the bowels. He lived until near noon of the following day in the most excruciating pain, when death mercifully relieved him.

Laborers should not leave their own working places, and ought not to be allowed to run after the drivers and runners, nor in any manner to interfere with their work. If this young man had remained in his chamber, leaving the runner to do his own work, he would not have lost his life in the manner he did.

Orlando James was an American by birth, born of Welsh parents, and was twenty years of age.

Accident No. 9.—Joseph Eagan, a runner at the Seneca slope, Pittston Coal Company, Pittston borough, was fatally injured, March 7, by being crushed between mine cars. The accident was at first reported "not serious," but it proved to be very serious, as one of his legs was so badly crushed that amputation became necessary. His system was not strong enough to stand the operation, and he died on the 21st, notwithstanding every effort made to save his life. When injured, he was standing behind a car, when another car came down a run, crushing him between them.

Joseph Eagan was of Irish nationality, nineteen years of age.

Accident No. 15.—John O'Brien, a runner at the Filer colliery, Messrs. Filer & Livey, Winton borough, was fatally injured April 4, by being crushed by mine cars. This boy again was away from his proper place. He was on his way to a shanty where there was a fire, at the foot of the slope, and as he was approaching the shanty on the empty track, a loaded trip, of three cars, was just starting up the slope, and just as the trip cleared the latches, the coupling parted between the first and second cars of the trip, which let the two hind cars back with fearful velocity along

the empty track to meet him. Seeing the cars going down upon him, James McDermott, the footman, called to him at the top of his voice, and O'Brien made an effort to get away, but in his excitement he slipped and fell, and the cars came upon him, lacerating the flesh from the ankle to the knee on one of his legs in a fearful manner, and also fracturing the bone. The boy, under the excitement of the moment, got up himself, and hopped away for some distance on his uninjured leg. He was then taken up the slope and into the carpenter shop, where he was provided with a pillow and a bed-quilt. A wagon, to convey him home, was not found for half an hour after, which was a very long time for the boy to wait in the condition he was in, and when a wagon was found, it was a clumsy old lumber wagon, wholly unfit to convey him home. Then his home was nearly four miles away, in Olyphant, and by the time he reached there, he was nearly dead from loss of blood and exposure to the cold. It seems to have been over two hours after the accident when he reached his home, and if the time given is correct, it was about two hours more before medical aid was secured for him. There was considerable feeling manifested in relation to the treatment the unfortunate boy received at the hands of the company officials, and on the other hand, the said officials excuse themselves, by asserting that if the boy was misused, his own friends and relatives were the parties to blame, as there were a number of them in attendance on him from the time he was brought up the slope until he reached his home in Olyphant, and among these, the following names are given: William J. Burke, Burgess of Winton borough; Peter Burke, driver boss, and James McDermott, footman at the Filer colliery. One thing is very evident, that between them all the injured boy was neglected in the most shameful and inhuman manner, and the probability is that he lost his life in consequence of this neglect. I do not think that R. D. Roberts, the mine boss, can shift the responsibility of caring properly for the boy from himself to the friends and relatives of the boy. It was his duty to see that he was cared for in the most tender and humane manner possible under the circumstances, and he should have seen to it that he was provided with proper conveyance to his home, and with proper medical attendance, with all the dispatch possible. But even a better course still, would have been to remove the boy to the house of Peter Burke, close by the mines, (Burke being the boy's cousin,) and have a surgeon attend him there as soon as one could be found. The slow journey for three or four miles over such rough roads as the roads were upon that day, and in such bitter cold weather as it was, was more than enough to finish the fatal work begun by the accident.

Unfavorable reflections were also cast upon J. E. O'Brien, M. D., the surgeon who was finally brought to the boy, and who did all he could, undoubtedly, to save his life, and in justice to the doctor I deem it proper to insert his own statement of his connection with the case, and it is as follows:

Scranton, Pa., *April 8, 1879.*

William S. Jones, Esquire.

*Inspector of Mines.*

Dear Sir: April 4, instant, I was called to Olyphant to see John O'Brien, who had his leg crushed at Winton. I arrived about six, P. M., and was informed that he had been hurt about two, P. M. He had been conveyed three or four miles in the cold, had considerable hemorrhage, and I found him in a cold room. I immediately had a stove brought in, gave him stimulants, and examined his injuries. The leg was crushed to a jelly from the ankle to the knee-joint. He was pulseless at the wrist. Dr. E. Traverse, who was present, said he was not quite so low when he first saw him, half an hour previous to my arrival. Notwithstanding all our efforts he never again rallied, nor had he full reaction and it became plainly evident to ourselves and the family, that he could not live long unless relieved of the incubus of torture and unavoidable hemorrhage occasioned by the crushed limb. We waited until about nine o'clock, when, it being certain that he would die if not relieved, we explained the matter fully to his mother and brothers, and with their full approval and consent, we determined to give him the only remaining chance to save his life, viz., amputation. At the same time it was fully explained and understood that this, though the only hope, was a slight one, and that it might fail. The amputation was performed quickly and well, without loss of blood or time, and for a few hours it seemed as if it would help him to rally. We remained with him until midnight. He died about four, A. M., and would unquestionably have died sooner without the amputation. I think that had he been taken from the mines immediately into a warm room near by, had stimulants given him, and amputation performed sooner, his life might have been saved.

Sincerely yours,

J. EMMETT O'BRIEN.

There is another version of the manner in which the accident occurred, which was given after my investigation, tending to place the responsibility for the accident more entirely on the deceased than the one given in the foregoing statement. But I am not satisfied that it is correct, but rather suspect that it has been manufactured for the occasion.

There is one thing, however, back of the whole affair that, had it been attended to, the accident could not have happened. I had ordered R. D. Roberts, the mine boss, to see that drags be attached to all the cars in the slope, to throw the cars off the track and prevent their running back in case the couplings or the rope should break. This was not done, and is not done yet, and it is contended that the inspector has no power to order them on. But as I shall notice this in another place, I will not enlarge upon it here.

Accident No. 17.—Thomas McKune, a footman at the Stark shaft, Pennsylvania Coal Company, Pleasant Valley borough, was fatally injured,

April 28th, by being crushed by loaded mine cars on an inside slope. From his own statement made to Peter Kearney just before he died, it appears that he was near the top of the slope walking up, when a loaded trip came along, and he attempted to jump on the chain attached to the trip, with the intention of riding to the top; but in his attempt to jump on he missed the chain and fell under the cars, and was crushed so seriously that he died at eight o'clock, P. M., the same day.

I was assured that he was in the habit of riding on loaded cars up this slope, notwithstanding he had been many times ordered not to do so, as it was not safe, and the mine ventilation law strictly forbade it. When thus admonished, instead of strictly obeying the law which was enacted for his safety, he would boastingly answer: "I can't get killed by the cars—there is no fear of that." But he *was* killed by the cars, as smart as he thought himself to be. This trouble is met with every day. Men think they are so smart that the law has no reference to them, and seem to think that they, because of their boasted smartness, are privileged characters, above the law, and can do just as they please. But these are the very men that are subject to accidents above all others.

Thomas McKune was of Irish nationality, twenty years of age.

ACCIDENT No. 29.—Rees Griffiths, a driver at the Sloan shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was killed, July 21, by being crushed by mine cars. This boy was going down a run with a trip of six cars, riding on the bumper of the forward car. Two of the cars were loaded with props, which caused the trip to run down the grade considerably faster than usual, as there were no more spraggs in the trip than would have been with the cars all empty. Near the bottom of the run it was customary to unhitch the mules from the trip, when they would turn out to the side and allow the trip to pass. When the mules reached the usual place to turn out they would do so, giving slack traces at the same time for the boy to unhitch them; but the boy in this instance failed to unhitch them, and the mules started up again briskly to get out of the way, and as the boy had one foot on the stretcher he was thrown from his seat, and was shoved along by the cars for about six yards, when the mules pulled the forward car across the track, and the momentum of the other cars upset it upon the boy, crushing him to death. More spraggs ought to have been put in the trip, as part of it was heavily loaded with timber. And I am utterly opposed to the custom of unhitching mules and turning them out in this manner when the cars are in rapid motion.

Rees Griffiths was of Welsh nationality, sixteen years of age, his mother, a widow, with one other son.

ACCIDENT No. 32.—Owen Flynn, a driver at the Roaring Brook shaft, Roaring Brook Coal Company, Dunmore borough, was fatally injured, August 13, by being crushed by mine cars. This sad accident was caused entirely by disobedience of orders on the part of two other boys, one of them being a brother to the deceased. Thomas Flynn and George O'Neill, the

two boys referred to, had gone in ahead of the boy that was killed, with an empty car. On their way in they had to go up a steep run, and near the top of this run a counter gangway turned off where there was a head-block, which the boys were ordered always to put on the track as they passed in to protect any one that might follow them up the run. In passing in, the boys neglected this block, and Thomas Flynn, on reaching the chambers, gathered a trip of loaded cars, and started out with it. About midway between the chambers and the main run there was a slight down grade, at the head of which he unhitched his mule and let the cars run down this grade by gravity, expecting that they would stop before they would reach the main run. But the cars, being unusually free running, ran by the point where the head-block was located, and on to the main run, where they met Owen Flynn, who was going up the run with his mule hitched to a car. Of course there was a fearful collision. The boy had a leg shattered in a shocking manner, and was knocked from the car to the side of the road, where he was afterwards found. He was brought out of the mines as soon as possible, a doctor was immediately sent for, and was at the top of the shaft to attend to him when he reached the surface, and a wagon was ready to convey him either to his home or to the hospital. Dr. Peter Winters examined the boy's injuries, gave some directions as to how to treat him, and advised them to carry him to the hospital at Scranton. In the meantime the boy's father had arrived, and his wishes were consulted, and the boy was conveyed to the hospital with his father's full approval and consent. But unfortunately the impression prevailed that he would not be received into the hospital without an order, or a permit, from somebody, and a great deal of valuable time was wasted searching for the person who was supposed to be authorized to grant a permit, and it was evening when the poor boy was finally received by the hospital steward under his care. He was so far gone by this time that nothing could be done to save his life, and he soon died. Owen Flynn was of Irish nationality, sixteen years of age.

Accident No. 42.—Peter Schmaltz, a driver at the No. 8 shaft, Pennsylvania Coal Company, Hughestown borough, was instantly killed, September 25, by being crushed between a mine car and a pillar. There was no one near him when the accident happened, and no one knew anything about it until his lifeless body was found alongside of the track, with his mule and trip standing near him. His skull was fractured, but the manner in which it was done was a mystery until I made a careful examination of the place surrounding that where he was found. On examining the roadbed, I found the remains of the boy's hat, consisting of the leather on the front of it, and also the ashes of his hat, which had been burned there. Then, on questioning those present, I learned that his lamp had been found in the same spot, and when the lamp was produced, it proved to be a kerosene lamp, and the solder all melted. I then examined the lamps of the other drivers and several workmen, who were present, and found that all were burning kerosene. I next made a careful and thorough examination

of the coal of a close pillar near by, and, after a long and close search, I found locks of the boy's hair sticking fast to the coal, plainly indicating the very place where his head had been crushed.

After finding these facts, and noticing that this gangway was the intake air-way, and that the air-current was quite strong, I put all the facts together, and came to the following conclusion: That the boy was coming out with his trip against this strong current of air, riding on the bumper of the forward car, on the same side as was the close pillar; that when approaching this close pillar, he found that his lamp and hat were on fire; that he took his hat from his head, and in his excitement, trying to extinguish the fire and still keep a light, he leaned out too far, and was caught and drawn in between the car and the pillar, crushing him to death. If this was not the manner in which the accident occurred, then the matter must remain a mystery.

Peter Schmaltz was of German nationality, fifteen years of age.

ACCIDENT No. 46.—Patrick Malia, a driver at the Leggett's Creek shaft, Delaware and Hudson Canal Company, Providence, was almost instantly killed, October 3, by being crushed by mine cars. This boy, again, was burning kerosene oil, known as the "World's Light," and was riding down a run on the bumper of the forward car of a trip, and against a strong current of air, and just as he was at the bottom of the run, his light went out, and his mules stopped suddenly, knocking him off the bumper and under the car. I was in this mine, and within a few yards of the place, when this accident happened. Hearing the poor boy's cries, I rushed to the spot, in company with Finlay Ross, the mine boss, and three of us lifted the forward end of the car, and held it up while the boy was taken out from under it, the whole thing being done in a few seconds. I then examined the boy's injuries, and found that the wheel of the car had torn the lower region of his bowels in a horrible manner; and I was sure he would die before we could reach the head of the shaft with him, which proved to be the case. The death of this fine boy, as well as that of Peter Schmaltz, was undoubtedly caused by using kerosene.

Patrick Malia was of Irish nationality, sixteen years of age, a widow's son, whose father was also killed in the mines only a few years ago.

ACCIDENT No. 47.—Peter Wall, a culm-man, at the No. 9 shaft, Pennsylvania Coal Company, Hughestown borough, was fatally injured, October 23, by being crushed by a mine car. This old gentleman's injuries were comparatively slight, but his old age militated against his recovery from the shock, and in three days he died. He was injured at the foot of the shaft, while sitting on a small bench close by the side of the track, waiting for a carriage to ascend. A few minutes before the accident, he and Patrick Gannon had come to the foot, after finishing their day's work, and as it was early, and some coal yet to be hoisted, Gannon asked the old man to go with him to the other side of the shaft, where they could sit out of the way until the coal was all hoisted. Gannon did go, and supposed Wall was

following him, but the old man remained where he was, and he had been there but a few minutes, when an empty car from the carriage, as it was being pushed by him, was knocked from the track, and thrown against him by a loaded trip which was coming in to the foot with too much force, fracturing the small bone of his leg near the ankle, and bruising the heel.

Peter Wall was of Irish nationality, sixty-five years of age, and left a widow, with six children, but they are all full grown.

Accident No. 57.—Mark Toolin, a driver, at the No. 3 shaft, Delaware and Hudson Canal Company, Carbondale City, was almost instantly killed, December 15, by being crushed by mine cars. This accident occurred on the main road, about five hundred yards from the foot of the shaft. At this point a run commences which extends for seventy-five yards. The boy was found at the head of this run, under a forward car of a trip of four cars. The mode of letting the cars down this run is as follows: On approaching the head of the run, the driver unhitches the mule, and throws the stretcher over its back, and the mule turns out to the side of the track, where it stands while the trip passes. The driver, in the mean time walks ahead of the trip a short distance, when he also allows the trip to pass, putting in the necessary spraggs as it goes by. The boy then jumps on the hind end of the trip, and the mule follows. I have no doubt, but Toolin lost his light as his mule was turning off the track, and that in trying to stop the trip he fell before it, and got under the car where he was found. He was burning the "World's Light," and like Malia and Schmaltz, I am afraid he lost his life by trying to save a few cents in the price of his oil.

As there was some trouble with the drivers on that day, most of them having refused to work, some were disposed to intimate that the boy had been interfered with by the strikers, hence, coronor Traverse impaneled a jury, and held an inquest, but no evidence of any foul play was elicited, and the jury returned a verdict of "death by accident."

#### Deaths from Explosions of Powder and Blasts.

There were five deaths from the above causes during the year—four from explosions of powder, and one from a premature explosion of a blast, being nearly eight and a half per centum of the whole number.

Accident No. 5.—Alexander McDonald, a miner at the Roaring Brook shaft, Roaring Brook Coal Company, Dunmore borough, was fatally burned by an explosion of a keg of powder. He had just made a cartridge from the keg of powder, but neglected to cover the keg, and to close the end of the cartridge; and, in putting his lamp in his hat, a spark fell into the open end of the cartridge, exploding that, which, in turn, exploded the powder in the keg. When he was conveyed home, he was not thought to be dangerously burned. He was conscious, and conversed freely, explaining lucidly all about the way the explosion occurred, but he died that night from his injuries. Alexander McDonald was of Irish nationality, fifty years of age, and left a widow, with six children, (mostly grown up,) to mourn his loss.

ACCIDENT No. 16.—James Foy, a laborer working for Thomas T. Jones, at the Von Storch slope, Delaware and Hudson Canal Company, Providence, was fatally burned, April 8, by an explosion of twenty-five pounds of "cartridge powder," which he was carrying into the mines in a canvas bag. On reaching the mines to investigate the cause of the accident, I was met with so many rumors in relation to the matter that I resolved, first of all, to visit Foy himself, and take his statement in relation to it, which is as follows: "I had been for the keg of "cartridge powder" the evening before, and took it home with me so as to have it ready to take into the mines in the morning. It was inclosed in a canvas bag. The following morning, I was taking it into the mines, carrying it on my shoulder. Had my lamp stuck in my hat, and, as I was going through a door, the powder exploded. Cannot say how it happened. There is no truth in the report that I was sitting down, with the powder in my lap, and that I fell asleep. The powder did not explode all at once. After the first flash, I dropped it. My clothes took fire, and I was burned most, I think, from the burning of my clothes. I tore them off as quick as I could, but my pants were burned to a crisp before I could get them off. I was just on the branch leading to the chamber where I worked. Was working for Thomas T. Jones. Was taking in the powder for him." The version given by the employés at the mines differed very materially from the above, and in substance was as follows: "Foy got the powder the night before, and carried it home, as he states himself. But he spent the whole night at a ball, and, when he entered the mines the following morning, carrying the powder with him, he was considerably under the effects of the night's dissipation; and when he got about twenty-five yards inside of the door of which he spake, where there is a head-block, he sat down on said block, with the powder in his lap, and his lamp in his hand. In that position he fell asleep, and, in his sleep, his lamp came in contact with the canvas bag, burning it through to the powder, causing the explosion." Finding these statements so much at variance, I went in to the scene of the explosion to try to learn which was the correct one, and, after considerable search, I found a part of Foy's burnt clothing in an entrance to an old airway, just inside the door. But there was no sign of an explosion of powder having occurred anywhere near the door. I then went up the run eighty feet from the door, where I found the head-block spoken of; and, on closely examing that locality, I found unmistakable signs of the explosion, consisting of the ashes of the cartridge paper, cinders of the canvas bag, and some wet powder that had not burned. This proved conclusively that the explosion occurred at this point, and not at the door, as Foy asserted; and the natural inference was that Foy was sitting there, and that he fell asleep, as stated, and the explosion followed, as a natural consequence. Now, such an accident as this would have been impossible, if an order issued by me to all the mine officials in my district on the 9th of April, 1877, had been carried out in good faith. This order was in the following words: "The sale of 'cartridge powder' to the work-

men, unless incased in wooden or metallic boxes, must be discontinued. Canvas bags and paper wrappings are not safe, and must not be used." But, like many other orders bearing on the safety of the workmen, where it is not expressly prohibited in plain terms in the mine ventilation act, this order was entirely ignored by the officials of the Delaware and Hudson Canal Company, until a life was sacrificed to compel them to see the wisdom and reasonableness of the order. James Foy was of Irish nationality, twenty-four years of age, and no family.

Accident No. 23.—Patrick Roach, a laborer, working for John Dewire at the No. 2 Diamond slope, Delaware, Lackawanna and Western Railroad Company, Hyde Park, was instantly killed, June 2, by a premature blast. Dewire had a hole drilled and was inserting a cartridge, and according to his own statement, he first pushed in the cartridge with a scraper, and on inserting the needle he thought the powder was very loose, he therefore withdrew the needle again and inserted the butt end of his drill to tamp the powder in the hole, and in doing this the drill struck a spark from a streak of sulphur, exploding the blast and throwing out all the coal lying before it.

Patrick Roach was at the end of the road pushing out a car, right in front of the blast, and was brained on the spot. Dewire himself was thrown back about five yards and was severely injured. He, however, recovered, and I suppose has been allowed to go back to his work to cause the death of some one else by his recklessness, or perhaps end his own life. Unfortunately the wrong man was killed in this instance.

This practice of driving in cartridges with the butt end of the drills is one of the most reckless and fool-hardy that a miner can be guilty of, and though I have tried hard to break it up, many still persist in following it. In my circular of April 9, 1877, I submitted the following rule: "That any miner who may be so reckless as to force a cartridge into a hole with the butt end of a drill should be discharged at once. No careful and competent miner will ever thus court death to himself and those who may be around him."

Patrick Roach was of Irish nationality, fifty years of age, and left a widow with three children to mourn his untimely loss.

Accident No. 41.—William Mangan, a miner at the Meadow Brook shaft, Messrs. W. Connell & Co., Scranton city, was fatally burned, September 24, by an explosion of a keg of powder. Mangan was making a cartridge with his lamp hanging in his hat, standing right over an open keg of powder which he had brought in that day, and which, therefore, must have been nearly a full keg. The roof was quite low at the place, and his lamp rubbed in it causing sparks to fall into the powder exploding it. He was fearfully burned, his clothes being burned from the greater part of his body, even his boots were all crimped up with the fire.

This is another warning to those who continually do this thing, but it is to be feared that but few if any will heed it, and that men will go on doing

it, notwithstanding they have been kindly warned against it times innumerable. I hardly ever go through a colliery, but I find men recklessly standing over their powder boxes, making cartridges or doing something else, with their lamps hanging in their hats on their heads, and when I speak to them of the fearful risk they take, they give all manner of excuses for the practice, the favorite one being that "they have always done so and no harm has ever happened to them."

William Mangan was of Irish nationality, fifty years of age, and left a widow with five children, in very poor circumstances, to mourn for him.

ACCIDENT No. 51.—Patrick Carroll, a laborer, working for Matthias Clemmens at the Sibley shaft, Pennsylvania Anthracite Coal Company, Old Forge township, was fatally burned, November 3, by an explosion of powder. He was a lad only eighteen years of age, and Clemmens, his stepfather, sent him to make a cartridge. There was about a half a keg of powder which in some manner was exploded by a spark from his lamp, burning him in a shocking manner. He lived in the most intense pain until the night of the 5th, when death relieved him. I was informed that nothing had been done for the poor boy from the time he was burned up to his death. Doctors Houser and Porteus were called to him, but pronounced him fatally injured, therefore they prescribed no treatment for him.

It is very possible that their diagnosis of the case was correct, but still I cannot persuade myself to believe but something could have been done to ease his terrible pains at least, and it seems to me that the common instinct of humanity should have prompted that much.

#### Death from Miscellaneous Causes Underground.

There were two deaths from miscellaneous causes underground during the year, one killed by a plank falling down the shaft upon him, and the other by being kicked by a mule, being nearly three and four tenth per centum of the whole number.

ACCIDENT No. 34.—Thomas Williams, a sinker at the Barnum shaft, Pennsylvania Coal Company, Pittston township, was instantly killed August 27, by a plank falling down the shaft. This is a new shaft which was being sunk, and was down eighty feet from the surface, at the time of the accident. The sinking was done by James C. Smythe, who, on the investigation into the cause of the accident, gave the following statement:

"I am in charge of the whole operation of sinking this shaft. We had a platform at the surface landing, composed of three-inch plank, which was six feet long, and extending over the shaft for five feet, one end of the plank resting on the sill of the tower framing, and the other end resting on a three by twelve inch cross-timber over the shaft.

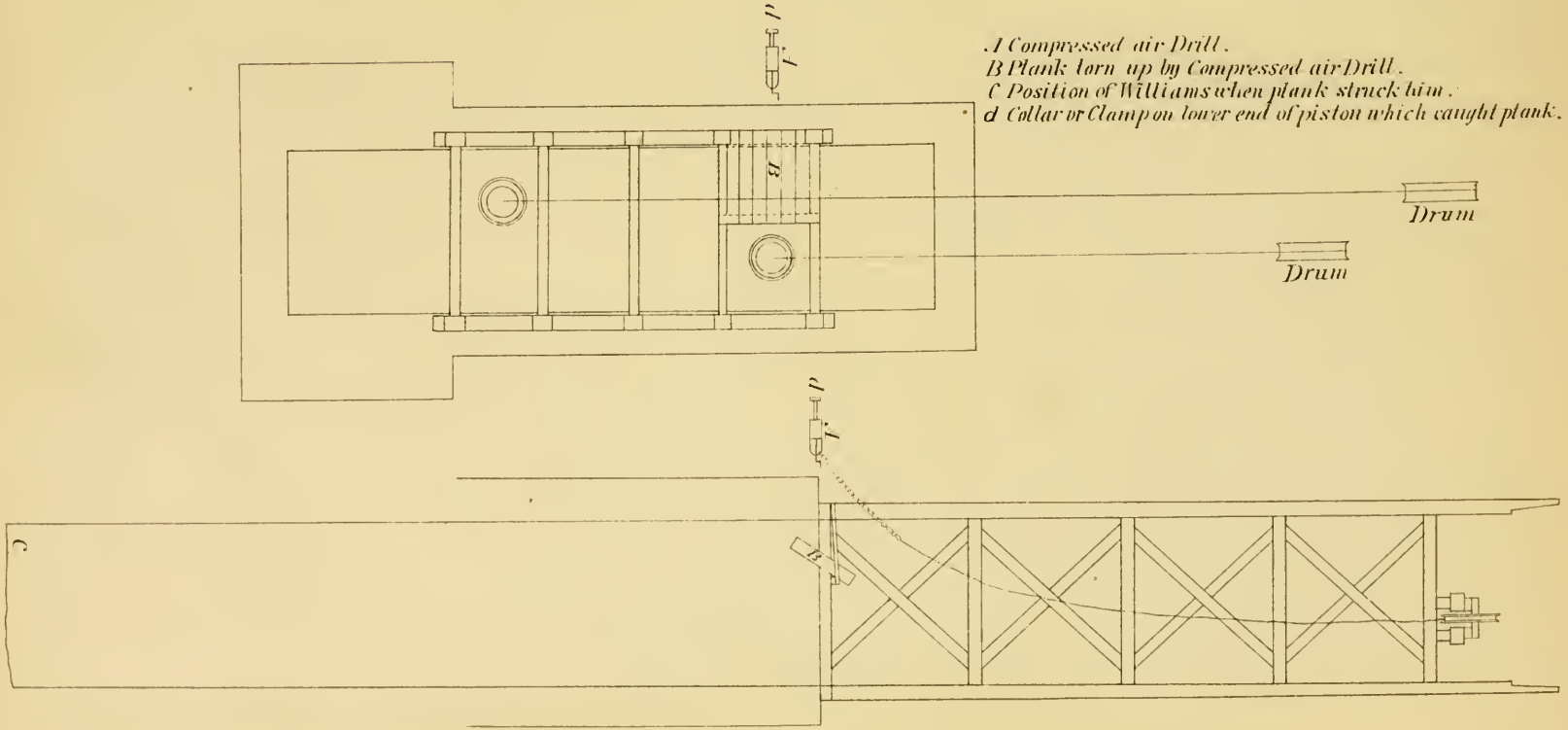
The plank composing this platform were spiked to the sill and cross-timber, with six-inch spikes. The platform was six feet wide, and was used as a landing for the men working in the shaft, and for lowering and hoisting tools, supplies, &c. We never landed the bucket here. We have two men attending to this landing and the one above, where the excavations are

PLAN No3.

# PLAN

# EXPLAINING ACCIDENT No 34 AT BARNUMS SHAFT,

## *Penna. Coal Co., Pittston, Pa., August 27th 1879.*



landed. It is the duty of those two to land the excavated stuff from the shaft, and attend to the top generally, as required by the men at the bottom. There were no orders or directions given by me as to how they should send tools, boring machines, &c., down the shaft, but they knew that this platform was put there expressly to hold any tools or machines required by the men below, and it was well understood that all tools and machines were to be placed on the platform, and to be lowered from that position.

"Thomas Williams was killed by one of the planks composing this platform being torn loose from its fastenings, and its falling down the shaft, striking him on the head, fracturing his skull. The plank fell a distance of eighty feet. My opinion in relation to the cause of the plank falling is, that the boring machine, which they were in the act of hoisting over the side of the shaft preparatory to lowering, must have caught in the end of the plank on the outside of the sill, tearing it loose and hurling it down the shaft. The machine weighs from two hundred and fifty to three hundred pounds. When the men at the bottom called for the machine, the two headmen should have placed it on the platform, then attach the rope to it, have it hoisted clear of the platform, and then have it lowered down the shaft. I am very positive that the machine was not on the platform as it should have been on this occasion, but lay on the ground in a hollow, outside of the tower framing. Had it been on the platform, it would have been impossible for the accident to occur, and no one should have attempted to lower the machine into the shaft, without lifting it to the platform before attaching the rope to it. Hugh Sheridan, the chief headman, is responsible for attaching the rope to it when it laid outside of the framing. The name of the other headman is Alexander Tompkins."

I was perfectly satisfied that Mr. Smythe's statement was in every essential point correct; still, as the responsibility for the accident, according to his statement, was so completely saddled upon Hugh Sheridan, I resolved to give him a hearing, and his statement of the case is as follows:

"I am chief headman on the landings of this shaft; was at work last Wednesday night when Thomas Williams was killed; he was killed by the falling of a plank from the top to the bottom of the shaft; the plank was torn loose by a boring machine which we were about to lower into the shaft to the men working there. The machine was leaning against the sill of the tower framing on the outside. We hitched the rope to it, and as it was being hoisted, I had hold of the lower end of it to lift it clear of the platform; but when it was hoisted to an angle of about forty-five degrees, the air piston ran out, and the end of it caught in the end of the plank, tearing it loose, and precipitated it down the shaft. The machine was always hoisted from that position; it was never first placed upon the platform. The end of the plank which was resting on the sill went down first. I tried to catch it with one hand, while holding the machine with the other. I held on to the machine for fear it would go into the space occupied by the plank, and knock away the cross timber upon which the remaining planks

of the platform rested, thus precipitating the whole platform down the shaft upon the men at the bottom. When I saw the plank going down, I cried out—'Look out below!' but the plank was at the bottom about as soon as the sound of my voice."

On hearing the above testimony of Sheridan, Mr. Smythe asserted very positively that when he was around, the machine spoken of was always first placed upon the platform before the rope was attached to it, and that he never knew it to be handled in any other manner. One thing is self-evident, and that is that it was not handled properly on this occasion, and that the blunder resulted in the loss of one man's life and in serious injury to another. The accompanying plan will show the whole affair at a glance.

Thomas Williams was of English nationality, twenty-one years of age.

ACCIDENT No. 53.—John David Humphreys, a driver at the Grassy Island shaft, Delaware and Hudson Canal Company, Olyphant borough, was almost instantly killed, November 25, by being kicked by a mule. This boy was driving and running cars from the foot of an inside plane to the branch at the foot of the shaft. He had run down his trip, and was following it on a run along side of the mule until he came down on the main or south heading road where, as the mule was going too fast for him, he was obliged to let go of her bridle and let her pass him, and just as she was passing him she kicked him in the pit of the stomach, killing him as already stated. The mule had the name of being a very quiet one up to this time; but she had lost her good name when I visited the colliery a few days after, and she indulged in her propensity for kicking twice that day. An inquest was held by Coroner Traverse, (of which I was not notified,) and a verdict rendered of "death by accident."

**Death from Miscellaneous Causes on the Surface.**

There were six deaths from miscellaneous causes above ground during the year, being ten and two tenths per centum of the whole number nearly. One was killed by a mine locomotive, one by a culm car, one by big cars, one by falling into a culm and slate pocket in a breaker, one by burning with carbolic acid, and one by falling from a wall.

ACCIDENT No. 24.—John Humphreys, a mine boss at the National colliery, Messrs. W. Connell & Co., Scranton city, was almost instantly killed, July 2, by being crushed between a mine locomotive and its tender. The accident occurred on a lateral track, connecting the National breaker with the Meadow Brook tunnels. Humphreys was riding on the hind end of the tender, on his way to the office at Meadow Brook, in company with William Monsey, and when about midway between the two points, the tender jumped the track on a short curve, throwing him between the tender and locomotive, and crushing him to death. The cause of the tender jumping the track was a bad rail joint. The old gentleman had been in feeble health for some time, and he should not have been at work, and a slight shock was therefore sufficient to cause his death.

John Humphreys was of Welsh nationality, sixty-six years of age, and left an aged widow to mourn his loss.

Accident No. 43.—James Moran, a slate picker, eleven years of age, at the Leggett's Creek shaft breaker, Delaware and Hudson Canal Company, Providence, was killed, October 2, by being run over by a culm car. The paymaster was at the colliery, and the boy was on his way to the office to draw his wages; but instead of taking the way provided for travel out of the breaker, he took an unusual way, over which he had no business to go, and which led him cross the foot of the culm plane. At this point there was a ladder to descend from a wall to the level of the culm track, between the breaker and a small building called a "friction room," the latter, therefore, standing between the ladder spoken of and the culm plane, so that a car descending the plane cannot be seen. The boy was just emerging from behind this "friction room," and was hurrying over the track, when a culm car coming down the plane knocked him down and dragged him some distance, the wheels finally passing over him at the loins, tearing the flesh in a shocking manner. He died in about forty minutes. He was the son of a widow, his father having been killed in the mines a few years before.

Accident No. 49.—Philip Killian, a slate picker at the Seneca slope breaker, Pittston Coal Company, Pittston borough, was instantly killed, October 29, by being crushed by a large box car under the chutes. He was employed picking slate out of the transportation cars as they were being loaded under the chutes; but at the time of the accident he was assisting to lower two box cars down the grade to their proper position for loading, and as one of the cars had a bad brake, a rail was used to slide the wheels. The boy had hold of this rail, but was standing on the wrong side of it, and as the car descended the grade, with the rail sticking out from the wheel, it came in contact with a snubbing post, breaking the rail, a piece of it striking the boy, knocking him right before the wheels of the hind truck of the car, which crushed him to death. He was doing what he had no business to do, and what he had been told many times not to do, and lost his life by disobeying the orders of his employers. He was said to be a fine boy, an American by birth, fifteen years of age.

Accident No. 50.—Evan R. Jones, a slate picker, at the Capouse shaft breaker, Lackawanna Iron and Coal Company, Hyde Park, was fatally injured, November 1, by falling into a slate and culm pocket. He died of his injuries on the following day. A short time before the accident, he had asked John Walters, the breaker boss, for permission to go to the water-closet, and was at first refused, but the boy said he must go, and Walters gave him permission, at the same time ordering him to hurry back. The boy then went off, and as he was longer away than Walters thought necessary, he inquired of the other boys for him, and was informed by two of them, that he had gone down a hole into which they dumped their boxes, leading to the culm and slate pocket. Walters, on searching for him, heard him groaning below him in the pocket, hastened to him, and found him unconscious, having fallen a distance of twenty feet. In falling, he must have struck against a nail, for his skull was punctured, and lock-jaw ensued. He

did not regain consciousness, but was in convulsions nearly the whole time until he died. It is impossible to conjecture what induced the boy to go into that place. He was a fine looking boy, and ought to have been at school, being not fully ten years of age. Poverty did not compel his parents to send the little fellow to the breaker.

ACCIDENT No. 56.—Adam Roth, a blacksmith's helper at the Continental shaft, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was fatally burned, December 13, with carbolic acid. He had been sent to the Taylor shaft with two mules, and in returning had two other mules, and also had three bottles containing drugs, from the company's farrier, which he was carrying to the stable boss at the Continental. In one bottle there was a half fluid ounce of *aconite;* another contained eight to ten ounces of tincture of aloes and myrrh, and the third contained seven ounces of carbolic acid in its strongest liquid solution. These drugs were given into his charge by James Ingals, assistant to his father, who is farrier for the company. None of these bottles were labeled to indicate their contents, excepting the one containing the aconite. Adam Roth, evidently knew nothing of the dangerous and poisonous nature of these drugs, and there was nothing on the bottle containing the carbolic acid to enlighten him. He was simply told in a general way, to be careful of the bottles, but such a warning would have been natural, whatever the nature of their contents might be, but in my humble opinion it was not definite enough where the drugs were so poisonous as were these.

On his way, Roth made up his mind that he would ride one of the mules, but in attempting to jump on the mule's back, he broke the bottle containing the carbolic acid, which he had put in his pants pocket, and the lower part of his body was completely deluged with the drug, which burned his flesh in a fearful manner, also taken freely into his system by absorption. Doctor L. H. Gibbs, who was called to him, gave his opinion as to the cause of his death, when testifying at the coroner's inquest, in the following words: "The cause of death, in my opinion, was the absorption of carbolic acid, through the lower tissues of the scrotum and sectrum, and through the skin, and ultimately through its paralyzing influence on the brain and heart. I found Roth in the house, lying on the floor. Made an examination, and found his buttocks, the back of his legs, and the scrotum of a purple color, and his legs of a bright red flush, and the inside of the right thigh also. The odor of carbolic acid was plainly discernible. I examined him also as to whether he was paralyzed or not, and found complete paralysis of the muscles, with the exception of the respiratory muscles, and I found that reflux action could not be obtained. He was breathing with a snoring respiration, and the heart acting very irregularly, pulse beating rapidly."

The coroner's jury, from the evidence adduced, return the following verdict: "We, the undersigned jurors, do find that Adam Roth came to his death on the forenoon of December 13, 1879, in the township of Lackawanna, and in the county of Lackawanna, by the accidental breaking of a bottle

containing carbolic acid which he was carrying in his pocket, and the acid coming in contact with his person, producing paralysis and poisoning by absorption.

In witness whereof, as well the acting coroner as the undersigned jurors, have to this inquisition put their hands and seals, this 18th day of December, 1879.

R. K. Craufield,
*Acting Coroner.*
W. S. Decker, *Foreman.*
William Price,
Edward House,
Sylvanus Heermans,
George Fairchilds,
Valentine Erbach, *Jurors.*

Accident No. 59.—Michael Indorf, a loader at the Taylor shaft breaker, Delaware, Lackawanna and Western Railroad Company, Lackawanna township, was killed, December 26, by falling from a wall, fracturing his skull. He was found dead under the small coal pocket under the lump coal chute, and between two mine cars. Through some mishap or other, he had evidently fallen from a wall about three feet high, striking his head against a bolt connected with the door-latch of one of the cars, fracturing his skull, and causing his death. He was last seen alive by Casper Wibel, between two and three o'clock, P. M. About three o'clock, Mr. J. P. Cooper, inquired of Wibel where Indorf was, and Wibel answered, that he thought he had gone to the "sand bank." This being so probable, no further inquiry was made until night, when some member of the family, with whom he boarded, called at Mr. Cooper's house with the information that Indorf had not reached his home to his supper. Search was then instituted for him all around the breaker, and between eight and nine o'clock his body was found as before stated.

There can be no doubt as to the cause of his death. The bolt referred to was all spattered with his blood, and a fearful pool of blood had flown from his wound, apparently enough blood lost to cause his death, even if his skull was not fractured. He must have become unconscious at once upon receiving the injury, for, had he made any noise, he must have been heard, as there were men and boys working close by all the afternoon, but no one heard anything of him. His body was still warm when found, indicating that he lived for a considerable time after his fall. Michael Indorf was of German nationality, fifty-two years of age, and had no known relatives in this country, if at all.

**Strict Discipline necessary to prevent Accidents.**

Though there is a marked improvement in discipline in many of the collieries in the district, still I am forced to say that but very little effort has been made at any improvement in the majority of them, and, in some in-

stances, no effort at all has been made. The trouble seems to be that no permanent, general, or special rules are anywhere adopted for the purpose. As I have intimated in my former reports, I am very positive in the opinion that the mine ventilation law ought to have a series of general rules incorporated into it, bearing upon every class of work done in the mines, and such rules, in order to be effective, should be very stringent, and yet practical and reasonable in the highest degree. We want none of the work of demagogues, but such as will convince every candid and intelligent workman that they are intended and adapted to insure greater safety to himself and associates by their rigid enforcement.

A large number of such rules might be adopted that could not fail to do great good, and without something of the kind it is nearly impossible to insure proper discipline; and without rigid discipline we are fearfully crippled and obstructed in our best efforts to reduce accidents. It is conceded on all sides that nearly all the so-called accidents that occur in the mines are the direct results of either neglect or disobedience of orders; and until the orders given are based upon a plain enactment of law, there seems to be no power, or no inclination, to enforce them. Indeed, I am painfully convinced that the inclination is often wanting even where there is no doubt about the power, under the law, as it now stands. In nearly every case where I have been forced to institute prosecutions for violations of the plain letter of the law, instead of having the support and assistance of mine bosses, superintendents, operators, and workmen, I have had them all pitted against me, and in defense of the criminals. The rules I am contending for must reach these aiders and abettors of criminals, and should aim at an effective cure for this insubordination. So long as the mine officials defend the most glaring violations of law, there can be no hope for such discipline as we must have if we intend the law in this respect to be anything but a dead letter. This action of the mine officials and operators encourages the men under their charge to violate the law with impunity. I find both the men and officials in league against the enforcement of the law, and throwing every possible obstruction in my way when attempting to do my duty. It has come to such a pass that the inspector dare not call upon a workman to testify to a fact, because the men are intimidated and dare not testify to the truth. I am truly sorry for these men, and I assure them that I have no desire to victimize them, and will never call upon them when I find it possible for me to avoid it. But I feel that such a state of affairs makes discipline in the mines utterly impossible, and I hold that a code of rules should be so drawn up that they will strengthen and uphold the inspector in his efforts to insure discipline, and in enforcing the law. The workingmen ought to realize and understand that their health and safety is the only object in view in every enactment of this nature sought for. It is of no personal benefit to the inspector, and of no interest whatever to him, only so far as he has an interest in the welfare of the men.

Then again, the interests of the operators, as well as the safety and welfare of the men under their charge, ought to induce the mine officials of every grade to second every effort made to raise the standard of discipline. The property of the owners and operators, as well as the lives of the employés, is often destroyed by allowing the law to be violated; and I cannot understand how any one having charge of a colliery can be a faithful steward while defending such violations of law.

Take, for example, the loose and dangerous practice of neglecting doors in a colliery generating carbureted hydrogen gas, or any other neglect by which gas is allowed to accumulate, and where an explosion follows. In all such cases an outlay of money is always required to repair the damage done to the mines, and the owner or operator is forced to pay the bill, which is very often a heavy one. Such cases are of frequent occurrence, and yet the officials in charge of mines will defend their subordinates in neglecting to carry out such provisions of the law as would, if complied with, make such explosions impossible. Such conduct is nothing less than paying a premium on loose discipline, and is the strongest kind of encouragement for the most criminal violations of law. The same remarks may be applied to every class of accidents; and I am sorry to say that this looseness in discipline is the greatest obstacle in our way to reduce accidents.

As I have before intimated, it is of no pecuniary interest to the inspector whether the loss of life and limb, and the destruction of property through general neglect and carelessness, are averted or not. But he has an interest in the safety and welfare of his fellow-men, and in the success of those men who have invested their money in developing our coal industries, and he is sworn to do all in his power to look after those interests. I am aware that the inspectors are denied the credit due to an honest and conscientious discharge of duty, but I care nothing for that, so long as I have the approval of my own conscience.

I am laboring under the influence of a firm conviction, that the mine ventilation law was enacted to *prevent* accidents, or, in the words of the title of the act, that it is "An act to provide for the health and safety of persons employed in and around coal mines." It is of no use to look after accidents *after* they occur, only so far as we are enabled to learn lessons from them to enable us to prevent their repetition. By confining ourselves to such a course, we would be simply imitating the man who locked his barn-door after his horse was stolen. I prefer to lock the barn-door before the horse is stolen, and upon that principle I am striving to prevent accidents in the collieries in my district. I only want discipline in so far as it will effect this, and for the same reason I feel that we need both general and special rules to insure discipline. And when the Legislature takes the matter in hand, it should employ men who thoroughly understand the subject, to draft a bill for the purpose.

**Careless Handling of Blasting Powder.**

When we consider the immense quantity of blasting powder used in the present system of mining coal, and when we witness the reckless manner in which a very large number of the miners handle it, we should not be in the least surprised that so many accidents occur annually from its use. Indeed, it is more than surprising that so few accidents occur from this cause. There are hundreds of miners in my district without boxes to keep their powder in. It is thrown about on the gobs, in cross-headings, and along the roadsides, with nothing to protect it from flying sparks from the lamps of the passers-by. When they need powder for use, they rush for it with their lamps hanging in their hats, and often with lighted pipes in their mouths. This reckless practice is also followed by many who have boxes, and when their attention is called to the fearful danger to which they expose themselves, many of them take offense and defend the practice, declaring that there is no danger in it. I have had some of them assert that they have followed the practice of making cartridges, standing over open kegs of powder with their lamps hanging in their hats "for twenty years;" others "for thirty years;" others "have always done so," without receiving any harm. I have seen some of these men lose their lives in a few minutes after making such reckless assertions, and it seems passing strange that the remaining ones do not take warning and learn wisdom from the fatal experience of their comrades. They keep on doing as they have always done, notwithstanding they see men continually losing their lives in this manner, apparently under the impression that *they* can do it without receiving harm. They freely admit that it may be a very dangerous practice for others, but claim that there is no danger to them, and I often find the oldest and most experienced miners guilty of this recklessness. They must know that the practice is necessarily dangerous in itself, but they think that they should be allowed to take the risk, claiming that they are competent to take care of themselves.

Then, again, after passing safely through the danger of making a cartridge, these reckless men find that it is too large for the drilled hole, usually because the hole has not been drilled perfectly round. In such cases the cartridge is forced into the hole with the butt end of a drill. An innocent man lost his life instantly last year by this process; and hair-breadth escapes are of frequent occurrence.

Another dangerous practice that I notice nearly every day, is that of making the vicinity of the powder boxes resting places or loafing places. The parties guilty of doing this are generally laborers who gather together in groups to spin yarns and crack jokes while waiting for cars. I have many times witnessed as many as a dozen grouped together in this manner, seated on and about the powder boxes, and around loose powder lying on the gobs, and I have known several cases of this kind where explosions have occurred, seriously injuring the parties. There is always more or less loose powder surrounding those boxes, however careful the miners may be

in handling it, and the only safe way is, never to approach a powder box with a naked light. There are many cases where explosions have occurred by these men trimming their lamps close to the boxes allowing the sparks to fall at their feet, not dreaming that there could be a train of powder at their feet leading into the box.

Now, all these reckless and dangerous practices should be discontinued, and nothing further ought to be necessary to put a stop to them than the simple pointing out of the danger connected with them. But kindly warnings and friendly advice do not seem to have any effect to suppress the evil. There is not a single man working in any colliery in my whole district whose attention has not been called to this danger either by the inspector in person, or through the mine bosses. The only effective remedy seems to be the summary punishment of those found guilty of these practices; and the only punishment that can be enforced is in the hands of mine bosses and superintendents in charge of the collieries. If we had a code of rules such as I have recommended, the matter could be completely covered, but in the absence of law on the subject, there seems to be nothing left but for the mine bosses to discharge all men who refuse to reform on being warned and advised. If it was understood that this would be done, we would soon get rid of the evil.

Every miner should be compelled to provide himself with a box in which to store his powder in his working place; and he should locate it in a secure spot, away from the roadside; and should never approach it himself, nor allow any one else to approach it, with a naked lamp or a lighted pipe. A place should always be fixed to place the lamp on approaching the box at least three yards away from it, and great care should be taken that this place is always to the leeward of the box, so that any sparks that may fly from the lamp may be carried away from it by the air current and not toward it. The boxes should have close covers, and should never be left open, and no loafing should be allowed near them.

As an illustration of the importance of following these simple rules, I will here relate an incident that occurred to a miner in one of the collieries in this valley, who was unusually careful in handling powder, but who, on one occasion, forgot his usual precaution. He had gone to his box to make a cartridge, putting his lamp away some distance as he approached it. After making his cartridge he closed the box and turned away, taking up his lamp as he started; but just as he hung the lamp on his hat he remembered that he had not provided himself with a squib to fire the blast with; and instead of removing the lamp again from his hat, he turned back to the box which he opened with the lamp on his head, and just as he was stooping to get a squib the lamp fell from his hat right into a keg two thirds full of powder which stood in the box uncovered. In sticking the lamp in his hat, he had not put the hook in the place made to receive it, and when he bent over the lamp fell off, but very fortunately for him, the lamp fell bottom downward into the powder, and did not explode it. It is not at all probable that such

a thing would occur again in one case out of ten thousand, and I would advise no man to try the experiment.

The miner, in this case, expected to be blown into eternity on the instant, and could not at first understand why the powder did not explode. He ran to a safe distance, and then looked back and saw the light shining brightly up out of the box, and finally got to understand the situation. The next question was how to recover the lamp. After waiting for a time to consider what to do, he resolved to venture quietly up to the box and pick it up out of its perilous position, and he succeeded in doing so. This exciting and startling incident completely cured this miner, and it ought to teach all others that it is impossible to be too careful in handling powder.

But the danger does not all lay in the making of cartridges and around the powder boxes. After the cartridge is made, great care is necessary in inserting it into the drill hole, and the miner should always make himself absolutely sure that the drill hole is round enough to receive it. A cartridge should never be forced into a hole by ramming it; and any man guilty of doing so reckless an act, ought to be forever prohibited from mining. Boring machines are very good to prevent this, for the holes bored by them are always round and perfect.

After charging the hole, and when ready to apply the match, the warning to neighboring workmen of the intention to fire a blast should be so plain and explicit that a misunderstanding would be impossible. The approaches to the vicinity of the blast should always be guarded, so that no one can run into danger unawares; and if the blast be in an entrance or cross-heading, the miner should never fire until he has first sent word to those working on the opposite side, and assuring himself that all are out of danger. The custom of rapping on the coal is not a proper warning; and in all cases where the men on the opposite side may be temporarily absent, that working place should be carefully watched until the blast explodes. The irregular way in which chambers are driven, causing so much uncertainty in relation to the thickness of pillars, makes it necessary also to warn parties on the opposite side when blasts are about to be fired on the pillar rib. There are many instances of blasts blowing through pillars in this manner, and some instances where men have been killed thereby.

There is another very dangerous practice still in vogue, though I have done all in my power to put an end to it. I refer to the custom of dealing out powder to the miners in paper wrappers and in canvas bags. I am pleased that I can testify that the greater number of the operators have discontinued this practice at my request, and I am very greatful to them for doing so, but there are a few who still persist in it, and I fear that more lives must be sacrificed before the custom can be stopped. One life was lost from this cause in 1879—that of James Foy—at the Von Storch slope, Providence. In that case a keg of powder had been given out of the magazine, inclosed in a canvas bag. In carrying the powder into the mines the bag took fire, the powder exploded, and one more was added to the list of

fatal accidents for the year. The powder which is given out in this manner, is that which is known as "cartridge powder," some of which is sent to the collieries in fifty pound packages. This quantity is double that which the miners want at one time, hence the packages are opened in the magazine and their contents dealt out in halves; and as there is but one box, one half must go without a box to keep it in. The powder makers ought not to put it up in larger packages than twenty-five pounds; and I am glad to see that there is a readiness on their part to provide the powder in such sized packages as is ordered.

**Kerosene, "The World's Light," and Mixed Oils.**

The twentieth section of the mine ventilation act makes it "lawful for any inspector," amongst other things, "to inspect and to make inquiry into the mode of lighting and using lights in any coal mine and colliery in his district." Now, outside of the matter of using naked lights or safety lamps, I look upon this as a very delicate subject. Its delicacy lies in the claim made by the employés, that the old fish and sperm oils are too costly, and that under the low rate of wages which they have been, and are still, receiving, they cannot afford to burn them. Hence, they have introduced kerosene, "World's Light," and other oils, and a mixture of those oils with fish or whale oils, into the mines, under the plea of economy. New styles of lamps have been invented to burn these oils, which are alleged to be safe, and provide as good a light as the old style lamps, burning the best quality of sperm oil, while it is asserted that there is a saving of fully one hundred per centum in the cost. The kerosene was the first oil introduced as a substitute for the old oils. This I have always looked upon as objectionable, and have always disapproved of its use, though, as yet, I have taken no decisive action with the view of prohibiting its use. It is well known that much of this oil that is sold for domestic use will not stand the legal fire test of one hundred and ten degrees Fahrenheit, and that many fatal accidents have occurred from its use; and knowing this, I cannot approve of its introduction into the mines. Instead of adding to the number of factors of danger in the mines, it should be our earnest effort to reduce them, and those who are employed in the mines should be the first ones to act in the matter; but I am sorry to say that the mass of them prefer taking the risk for the sake of the few shillings they may save in a year by the change.

Seeing that the raw kerosene was objectionable, because of its explosive properties, as well as for other reasons, another oil was introduced, which is nothing but kerosene still, but such as will stand an unusually high fire test. This is called "The World's Light." The sample tested by me stood a fire test of three hundred and twenty-five degrees Fahrenheit, and it was said that it could be furnished to the workmen at the retail price of twenty-five cents per gallon. So far as danger from explosions was concerned, I pronounced this oil non-explosive; and at the price named, I pronounced it cheaper than fish or whale oil. But after testing it thoroughly

in other respects, I find that there are many objections to its use in the mines. There is also an inferior oil of the same class, which, it is alleged, will stand a fire test of one hundred and fifty degrees Fahrenheit; that is used by a large number. And many use a mixture of fish oil and these several grades of kerosene.

Now, it is with great reluctance that I object to the use of these oils by the workmen, as I do not desire to add one cent to their expenses. But I am so positive that there is danger in using them, that I feel constrained to protest against their use. There is more danger to some classes of workmen than to others, and I believe them to be injurious to the health of all. I find that the smoke generated by the burning of these oils is much greater than that arising from the burning of whale oil, and the odor of the smoke is far more nauseous and sickening, and they burn with such intensity, that the heat must affect the head very injuriously. In these directions they are injurious to all classes of workmen alike, but there are directions in which the burning of them are more dangerous to one class than to another.

The miners, for instance, are so reckless that they use these oils to make matches to fire blasts with, and I am certain that men have been injured by doing so, and one man at least has already been killed thereby. It may seem incredible that men will do this, but I know whereof I speak, for I have seen several of them do it, and have had them argue with me that there is no danger in doing it. But some admit that it is dangerous to make matches with, but add that the fact that miners make this misuse of them, is no reason for prohibiting their use altogether. But I think it is a very good reason when added to the other objections that we find to their use. If men will be so fearfully reckless as to endanger their lives in this manner, they should be deprived of the opportunity by taking the means of self-destruction away from them.

Then there is another sense in which the burning of these oils is a great source of danger, and that is that the light goes out very easily. If the lamp is moved suddenly, or when traveling against a current of air, the light is extinguished, leaving the party depending upon it in total darkness. This makes the light a very unreliable and unsafe one, especially for drivers and runners, who are obliged to move rapidly, and often suddenly on main roads, and upon runs where the air-currents are strong. Whatever may be said in favor of using these oils by miners and laborers, I think that this last fact is more than sufficient in itself to convince all parties, that drivers, and runners at least should not use them There is not a shadow of doubt in my mind, but three fine boys lost their lives, by losing their lights in this manner during last year. Two of them lost their lights on runs, and fell under the cars, and were crushed to death, and the third's lamp and hat took fire, and while striving to put the fire out, he was caught between the cars and a close pillar, where he also was crushed to death. I refer to accidents No. 42, No. 46, and No. 57, in table No. 1.

As I have already intimated, this seems to be a very delicate question,

but I think the more intelligent class of workmen will agree with me, that the use of these oils should be prohibited. The light they produce is far from being as safe and healthy as that produced by the old oils, and the only thing that can be said in favor of them is, that they are cheaper. I most respectfully submit, therefore, that after trying the experiment with them for over a year's time, and after finding beyond a doubt, that the light which they provide, is not a safe and healthy one, every person should be willing to cast them aside, and return at once to the use of the old oils. It is very plain to me, that some action must be taken by somebody, in some way to suppress this evil, and it would undoubtedly be the better way for the workmen themselves to do it. They have the remedy in their own hands.

#### Drags on Mine Cars in Slopes.

We have safety appliances on carriages in shafts provided for by law, and it was no doubt an oversight that the slopes were not provided for. There are twenty-nine surface slopes in my district, nineteen of which are used for hoisting coal. And there are thirty-one inside slopes, all of which are used for hoisting coal. As a matter of course, there are a number of men and boys always near the foot of these slopes, and frequently traveling up and down, to and from their work. The couplings between the cars and the ropes are liable to break at all times, and they do frequently break, precipitating the cars back with fearful velocity, often resulting in loss of life. A life was lost in 1879 from this cause, at the Filer colliery, Winton borough. Another life was lost at the No. 1 tunnel, Pittston, in 1878. And another at the No. 2 slope, Jenkins township, in 1876, all of which would have been spared, if proper drags were attached to the cars. I have requested them put on the cars in all slopes, but it has not been done, as yet, by anybody. The only slope where they have been put on is the Mt. Pleasant slope, Hyde Park, operated at present by W. T. Smith, esquire. Here there is a drag attached to every car, and a runaway of loaded cars is a thing unknown, though the rope and couplings have parted many times since the drags were put on. They hoist four cars to the trip, and in every case where the couplings or rope was broken, the drags have either held the cars, or thrown them instantly from the track, thus preventing their running back. I have been an eye witness myself of this, more than once. These drags have been in use in this slope for many years, and they have paid for themselves many times over, in the saving of cars from destruction through runaways, and there is no doubt but they have also been the means of saving life.

The Mt. Pleasant drag consists of a piece of two inch square iron, about three feet long, with one end turned into a ring, to go on the axle inside of the wheel, and the other end is sharpened. When the car is moved in the opposite direction, the drag is fastened up tight to the sill of the car by a hook, and when the car reaches the foot of the slope, the footman drops it from the hook and allows it to drag. It is a very simple contrivance, and

if it were adopted in all the slopes, I am very certain that we would hear no more of runaways, only in cases where empty cars are pushed over the heads of slopes, without the rope attached to them.

In some instances, a single detached drag has been introduced, which is hung on to the coupling of the hind car of the trip, but this does not answer the purpose. Where there are two, three, four, and even five cars hoisted in a trip, especially on steep slopes, one drag is not sufficient to hold the trip. There should be a drag on every car. These loose drags often fly off when the cars come back upon them, and are therefore not reliable in that respect, whereas the Mt. Pleasant drags cannot fly off, and never fail to do their work.

It is true that the mine ventilation act does not explicitly state, in so many words, that drags must be put on cars in slopes, but it does make it the duty of the inspector "to make inquiry into all matters and things connected with, or relating to, the safety of persons employed in, or about any coal mine or colliery in his district." And the act also makes it his duty, "to see that every necessary precaution is taken to insure the safety of workmen," and I contend that drags are "necessary precautions," hence I have ordered them put on in every slope in my district, but I am sorry to say that I have not succeeded in a single instance. This must, therefore, remain a source of danger for some time yet, and other lives must be sacrified by runaways, before the simple remedy I recommend will be applied to provide against them.

#### Inadequate Ventilation the Real Cause of Gas Explosions.

There can be no doubt but that the real cause of all great explosions of carbureted hydrogen gas in coal mines, is the want of adequate ventilation to dilute the gas as it evolves from the strata. And there is no doubt but the too great reliance placed in the so-called safety-lamps, is the chief cause of inadequate ventilation. So long as it is held to be safe to work a colliery exclusively with safety-lamps, it is not to be expected that the quantity of air required to dilute the gas will be provided. But if the fact were once admitted that the so-called safety-lamps are such only in name, then, when it became apparently necessary to use them, mine owners would readily devise means to provide such ventilation, as would make their use unnecessary. It is well known that these lamps are not what the name implies, and yet they are relied on as if there was no doubt of their safety. The fact is admitted, but we act as if we did not believe it.

Now, I profess to be well enough acquainted with coal mining in this country to assert, without fear of successful contradiction, that there are no mines yet in operation, nor do I believe there ever will be, in the anthracite coal fields or elsewhere, but can be so thoroughly ventilated as to prevent explosions entirely. It may be insinuated that such an assertion is based on my "inexperience," but as I have been connected with coal mines all my life, (and I am not a young man,) I maintain that my experience will compare favorably with that of my unfair reviewers. But I will

PLAN No 4.

# PLAN OF BLANTYRE SPLINT COAL WORKINGS. 1877

Thomas Baldoir
John Baldoir
James Brown
James Brown
James Brown jr
John Burke
James Dunlop
Thomas Dunlop
Thomas Wardrop
Andrew Buchey
James Liddle
John Liddle jr
John Orr
Andrew Morris
Thomas Wardrop
Andrew Buchey
James Liddle
John Liddle jr
John Orr
Andrew Morris
Old Pit
Old Pit
Old Pit

go still further, and assert that the collieries in the anthracite regions of this State are fast becoming so well ventilated that no explosion can occur in them which should be attributed to inadequate ventilation. The greatest danger that threatens us arises from imperfect distribution and from loose discipline in relation to air-ways, brattice, doors, &c., &c. It is just as important to distribute the air properly throughout the workings as it is to provide a sufficient quantity of air for a colliery. The quantity of air provided, as a rule, is very liberal in our collieries where explosive gas is generated; and what explosions we have are always traceable directly to imperfect distribution, and allowing local accumulations of gas to lodge in places driven ahead of the air, or to some blunder of this nature. It is impossible for the atmosphere of a whole colliery to become explosive with us with the liberal quantity of ventilation provided.

The old workings should be attended to as well as the live workings, as no "standing gas" should be allowed to accumulate in any part of a colliery. It is well known that many acres of "old workings" in the collieries of England and Wales are walled up full of gas, and this, undoubtedly, has been the main cause of many an unexplained explosion, and must add fearfully to the force of explosions, even when not the direct cause. We should be very careful to avoid the possibility of being overwhelmed with gas from old workings, and the only sure way to do this is by preventing the gas to accumulate there.

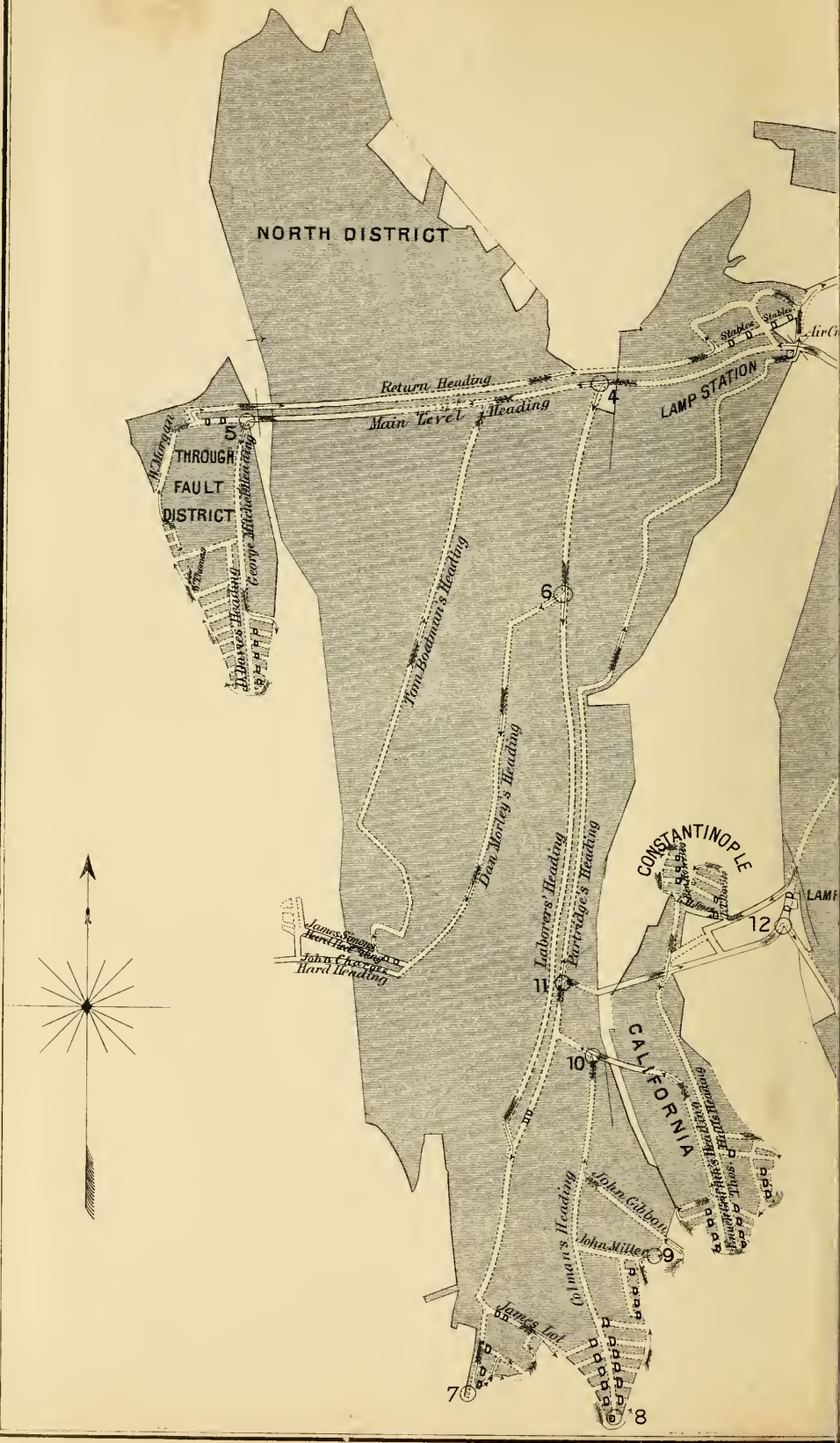
Another source of great danger lies in the custom of conducting air currents loaded with the gases and impurities of one colliery into the workings of another. We are furnished with a sad example of the fearful consequence of this practice, in the case of the terrible and destructive explosion at High Blantyre, Scotland, October 22, 1877, where two hundred and nine lives were lost. One of the main causes of this explosion was the ventilation of a large section of the south workings of No. 2 pit with air that was already heavily charged with the gas generated in the workings of No. 3 pit. The accompanying plan, with references, will explain the whole system at a glance. The total quantity of air provided for this large range of workings was from fifty-one thousand to fifty-six thousand cubic feet per minute, which was far from being an adequate amount to ventilate the workings properly, and it was also very badly distributed. It will be observed by the plan that No. 2 and No. 3 pits were down-cast—twenty-six thousand cubic feet per minute going down No. 3 pit, and twenty-five thousand to thirty thousand going down No. 2 pit. The air entering No. 3 pit was split to ventilate the workings of that pit, and then united again; and on entering the workings of No. 2 pit, was again split, sixteen thousand cubic feet going to the south workings, and ten thousand in the opposite direction. The split on the south side unites with a split running along the main south level from No. 2 pit, in the "cousie" running off from the south level, thence along the face of the workings on the west and to the upcast at No. 5 pit, which is the upcast

for No. 1 and No. 4 pits also. The system of ventilation will be readily understood by referring to the plan. The following notes are given to explain the explosion:

"The evidence shows that flame extended throughout nearly all the working places, except on the north side, and the adjoining rise workings of No. 2 pit. The men, except twenty-three in No. 2 north workings, were all killed. The general direction of the blast was from the "stoopings," (where "stoops," or pillars, were being worked out,) towards No. 2 shaft, and again increasing in intensity towards No. 3 shaft. The force also went from No. 3 towards No. 2 shaft. But it seems to have been most violent in the south workings of No. 2, especially in "Speir's dook." No. 3 shaft was also wrecked. Instances of the want of "throughing," or completing, each "stoop," or pillar, and thus occasioning excessive bratticing, may be seen in Sharp's place, in Clyde's dook; in Liddell's place, in Speir's dook; in Dobbie's place, at the top of the "cousie," near the stoopings, and in the far end of the left hand level, from near the top of the first cousie on the No. 2 south level. There was more than a mile and a quarter of bratticing where the air on the south side workings traveled. The mine being fiery, too many places were being opened, and they were being driven out too rapidly whilst the gas was being drained, at all events, for the quantity of ventilation provided. Fresh air should have been used for ventilating No. 2 shaft, south workings, instead of the return air from No. 3 pit workings. And the return air from the stoopings where firedamp accumulated should not have been taken through other workings."

All these notes are proper, and I insert them here that we may avoid falling into the same errors in this country. And the warning is all the more necessary because this very thing is done to some extent by our mine managers. It is a very dangerous system, and should be abandoned at once. There are some collieries ventilated in this manner in my district, but not near as many as there were in 1876, when I first entered on the duties of my office. At that time there was a continuous current of air passing through five collieries successively, these collieries being owned and operated by the Pennsylvania Coal Company, in Jenkins township. Since that time, two fans have been erected, and the distinct air currents for those collieries have been increased from one to three. It is true that those collieries are not considered very fiery; but there is gas generated in them all, and as they go down to the lower veins, the gas will undoubtedly increase. Every colliery must then be ventilated exclusively by itself, as all collieries should be, whether they generate carbureted hydrogen gas or not. Our mine ventilation law requires that, "the owners or agents of *every coal mine or colliery* shall provide and establish for every such coal mine or colliery an adequate amount of ventilation, * * * which shall be circulated through to the face of each and every working place throughout the entire mine," &c.; and it must consist of "pure air." Every one knows that air loaded with the "noxious, poisonous gases" of

PLAN No 3


NORTH DISTRICT
Return Heading
Main Level Heading
LAMP STATION
THROUGH FAULT DISTRICT
Tom Boadman's Heading
Dan Morley's Heading
Laborers' Heading
Partridge's Heading
CONSTANTINOPLE
CALIFORNIA
John Gibbon
John Miller
Colman's Heading
James Lot
Stables
4
5
6
7
8
9
10
11
12

# PLAN OF THE
# DINAS COLLIERY, SOUTH WALES.

Showing System of Ventilating One Vein with Return Air from two other Veins.

*Scale 7½ Chains to an Inch.*

one mine cannot be "pure air," as the law requires, when it enters another, and the law does not permit it.

Then it is just as dangerous to ventilate several veins with one current of air in any colliery. This again is done in England and Wales, and to some extent in this country. We have a terrible example of the danger of this practice in the explosion that occurred in the Dinas colliery, in the Rhondda Valley, South Wales, January 13, 1879, where sixty-two lives were lost. The Dinas colliery consisted of two shafts, known respectively as the "middle pit" and the "lower pit," situated about two hundred and forty yards apart, the latter being the down-cast. The down-cast is a circular shaft, ten feet in diameter, sunk some years ago to the "four-feet" or "polka" seam, the depth of which is three hundred and twenty-nine yards from the surface. It also passes through the "two-feet nine" seam, three hundred and seven yards from the surface. Both these seams were extensively worked, though the workings are not shown on the accompanying plan, or map of the colliery; and both seams generated gas quite freely. The other, or "middle pit," is the upcast, and is oval in shape, fifteen feet by twelve, and is four hundred and seven yards deep, going down to what is known as the "six-feet" seam.

The air current, as it passed down the lower pit, was split, one portion entering the "two-feet nine" seam, and the other portion entering the "four-feet" seam. Then these two currents, after ventilating the workings of both these seams, united again, and forming one current, passing down a staple pit seventy-eight yards deep from the "four-feet" to the "six-feet" seam, where this same air, already heavily charged with gas from the workings of the two seams above, was used to ventilate the extensive workings of the "six-feet," or lower seam, as shown on the plan. The greatest quantity of air claimed at any time before the explosion was seventy-two thousand seven hundred and fifty cubic feet per minute, which was produced by a large "Waddle fan," forty feet in diameter. It was said that this "quantity of air was amply sufficient to ventilate the colliery if properly and judiciously distributed." But I hold that it was a great mistake that each seam was not ventilated exclusively by itself, and that the air from the upper seams should not have been used in the lower seam.

The foregoing facts I have extracted from the official report of the commissioners appointed by the Government to inquire into the cause of the explosion at High Blantyre, and from the report of Mr. W. St. James Wheelhouse, Q. C., on the inquest following the explosion at the Dinas colliery. My object in referring to these cases is to warn our own mine managers from falling into the same errors. There are valuable lessons taught us always in the sad misfortunes of others, and if we are wise we will profit by them. And I refer to them also as unanswerable arguments in favor of such sweeping ventilation as will make such explosions forever impossible in our collieries.

Great stress is placed on the fact that the "conditions" under which one

colliery is ventilated are so much more advantageous and favorable than in other collieries. I readily admit that to be true, but I contend that it is equally true that the "conditions" are, to a very great extent, just what we make them, and can be made favorable or unfavorable very much at our discretion. Take the case of the High Blantyre collieries for instance. Here we have one comparatively small upcast—the exact sectional area being 78.54 square feet—to ventilate four collieries. Who is responsible for this state of affairs? Could not the "conditions" have been greatly improved in several ways from what they are? The upcast, or No. 5 pit, could have been made twice its present size; other pits could have been sunk; or the main hoisting pits could have been made large enough to be divided into down-casts and upcasts, thus ventilating each pit by itself; and either improvement would have greatly changed the "conditions" referred to.

There is a case now in my district where a fan, sixteen feet in diameter, has been erected over an upcast, having an area of only 25.5 square feet! What could be expected of such a fan under those "conditions?" It is not necessary to say that no fan under such conditions, can do itself justice. In this case the fan exhausts from twenty-five thousand to thirty thousand cubic feet per minute, but if the upcast was enlarged to four times its present size, the fan would then discharge one hundred thousand cubic feet with less power than it requires at present. Who is responsible for these unfavorable "conditions" in this case? I assert that the "conditions" here are just exactly what the managers made them.

Another fan 17.5 feet in diameter, was erected over an upcast of small sectional area in 1877, notwithstanding that I protested against the small size of the shaft, and when the fan was set running, it only produced eighteen thousand one hundred and twenty cubic feet per minute of air. In 1878, the area of the upcast was enlarged considerably, but not to the extent it should have been, and the fan now produces about sixty thousand cubic feet per minute. This result was obtained by changing the "conditions," and proves conclusively that the conditions are just what we make them, and that we are very far responsible for their being unfavorable. The same is true of the conditions under ground to a very great extent. I admit that there are greater difficulties to overcome in some collieries than in others, but I will not admit that they are insurmountable. Hence, I say again, that collieries can be provided with such sweeping ventilation, that explosions of gas need never occur. And until we have done all in our power to bring the ventilation of our coal mines up to this standard, we have no right to assert that it cannot be done, nor can we escape the charge of inhuman treatment of the working men.

When I say that it requires a certain proportion of air to gas, to dilute the latter, and make it non-explosive, I make no pretense to any new discovery, and yet it was new to many mine bosses in charge of our collieries. But I speak of it because it *is* known, and has been known years before

either I or my learned reviewers were born. And it is because the *remedy* for these fearful and life destroying explosions is so well known, that I urge its application with so much earnestness. Knowing the remedy so well, there can be no excuse for allowing the wholesale slaughter of our fellow men to continue. Holy writ teaches, that "He that knoweth his Master's will, and doeth it not, shall be punished with many stripes." So I say: He that knoweth the remedy for this fearful loss of life, through gas explosions, and does not apply it, must be held responsible for the neglect.

Right here I desire to inform Prof. J. H. Harden, M. E., of Philadelphia, Pa., in the most respectful manner possible, that I am not so ignorant of the great gas wells of the oil regions of western Pennsylvania, as he supposes. But I will very readily admit, that I was not aware of the fact, (?) that these gas wells are in any way connected with any coal mines, and as a natural consequence, must admit that I was not aware, that there is any necessity of devising means to ventilate them! Mr. Harden will please accept of my heartfelt thanks for this valuable piece of information. Of course, I will except the gas wells of the western part of the State, when I assert, that all the *coal mines* can be so thoroughly ventilated, that no explosion of gas need ever occur in them. I most willingly leave the gas wells in charge of Mr. Harden, hoping that his superior learning and experience will enable him to take the very best care of them.

But, seriously, has it not come to a pretty pass, when professional mining engineers will resort to such false premises to oppose a principle that they do not wish to become an established one? Mr. Harden, after referring to a number of "gas wells," thinks he settles the whole question with the broad assertion following: "In these examples, (the gas wells referred to,) the pressure and supply is sufficient, if suddenly released in the confined passages of a coal mine, to endanger the lives of all engaged therein; and we have no doubt that feeders of equal volume to some of these are occasionally found, which no ventilating machine is capable of neutralizing at the moment." I submit that his argument would have had some force if he had given us an example. He says he "could point to others," and probably he will be kind enough to do so, but let them be those of collieries, as we have had enough "gas well examples" already. I must not follow the off-hand criticisms of the scientific reviewers of my last report, however, for I have neither the time nor the inclination to do so. Had they been fair, and had they tended to enlighten the reader on the important subject treated, I would have been truly grateful; but as they were not, I am not in the least benefited, nor is any one else. I may continue to be the subject of sarcasm and ridicule of a certain class of engineers, but this subject will not be put down in that way. The facts that I now advocate, in the near future will be accepted in spite of all opposition, and the sooner this is done the better will it be, not only for the workingmen, but also for their employers.

**The Unsafety of the So-called Safety Lamps.**

In my report for 1878, I took radical grounds against the use of safety lamps in the mines for any other purpose than for trying or testing the condition of the workings as to gas. My remarks on the subject have been well received by many intelligent men, and, as might be expected, they have also provoked unfavorable comment from a few who always sneer at, and ridicule propositions that they cannot meet in any other way I have laid no claim that I have discovered any new facts in the case. The facts are well known to all but such as are so willfully blind that they will not see them; and I referred to them only because they are so generally admitted, and because it is so unaccountably strange that thousands of our fellow men are forced to use them to work in the greatest danger, notwithstanding they are known to be unsafe. If additional proof were wanting to establish the fact that working collieries exclusively with the so-called safety lamps is in the highest degree unsafe, the proof is presented in thundertones by each successive explosion. I, therefore, repeat what I asserted in my last report, that it is wrong—criminally wrong and inhuman—to persuade the miner that it is safe to work with these lamps, when it is known that it is not safe. Hundreds of lives are annually sacrificed to this fatal feeling of false security; and the professional mining engineer, knowing the fact, allows the sacrifice to be repeated over and over again, without one word of protest; and not only that, but the whole of them, with an honorable exception now and then, demand that the work of death shall go on from year to year, claiming that there is no help for it. But, thank God, there are honorable exceptions, and the number is continually increasing. These noble men are demonstrating, by numerous and exhaustive experiments, that the so-called safety lamps are unreliable; and I am happy to learn that they are honest and humane enough to declare that "the best of safety lamps are far from being what their name implies." And as I have a table showing the result of the latest published experiments of some of these excellent men, I will insert it here as a means of information for such as may not have seen it. The table is to be found in the "Transactions of the Manchester Geological Society," session of 1878–9, and also in the *Colliery Guardian* for August 29, 1879, and is a part of a valuable paper on safety lamps, prepared conjointly by Messrs. W. Smethurst, F. G. S., and James Ashworth, mining engineers. The experiments were made, at various times, at the Garswood Hall colliery, near Wigan, England, and in the presence of a large number of experts, amongst whom were Messrs. Dickinson, Hall, and Martin, Her Majesty's inspectors of mines, and a number of prominent mining engineers, managers, underwriters, &c. The table is as follows:

**Safety Lamp Experiments.**

| Velocity of the air, in feet, per minute. | Time. Minutes. | Time. Seconds. | Position of Shield. | Remarks. |
|---|---|---|---|---|
| | | | *Davy Lamp—$\frac{7}{8}$ inch gauze.* | |
| 430 | . . | 50 | No shield, | Exploded. |
| 600 | . . | 5¼ | do. | do. |
| | | | *Davy Lamp—1½ inch gauze.* | |
| 360 | 1 | 30 | No shield, | Did not explode. (*a*) |
| 380 | 3 | . . | do. | do. (*b*) |
| 400 | 3 | . . | do. | Did not explode. (*b*) |
| 420 | . . | 5 | do. | Exploded. |
| 420 | . . | 5 | Shield up to the top on the intake side, | do. |
| 600 | . . | 10 | do. do. do. | do. |
| 600 | . . | 12 | do. do. do. | do. (*c*) |
| 600 | . . | 4 | No shield, | do. |
| 520 | . . | 5 | do. | do. |
| 580 | . . | 3 | do. | do. |
| 600 | . . | 5¼ | do. | do. |
| 600 | . . | 7 | do. | do. |
| 580 | . . | 4¼ | do. | do. |
| 420 | . . | 5 | Shield down on the intake side, | do. |
| 480 | . . | 6 | do. do. | do. (*d*) |
| 550 | . . | 5 | do. do. | do. (*d*) |
| 560 | . . | 4¾ | do. do. | do. |
| 600 | . . | 9 | do. do. | do. |
| 600 | . . | 12 | do. do. | do. |
| 600 | . . | 14 | do. do. | do. |
| 560 | . . | 4 | Shield down on the return side, | do. (*e*) |
| 580 | . . | 5 | do. do. | do. |
| 600 | . . | 6 | do. do. | do. |
| 600 | . . | 7 | do. do. | do. |
| 600 | . . | 5¼ | do. do. | do. |
| 600 | . . | 8¼ | do. do. | do. |
| 600 | . . | 5½ | do. do. | do. |
| 600 | . . | 5¼ | do. do. | do. |
| 600 | . . | 2¾ | do. do. | do. |
| 440 | . . | 22 | Glass shield all round, | do. (*f*) |
| 580 | . . | 14 | do. do. | do. (*f*) |
| 500 | 3 | . . | do. do. | Did not explode. (*g*) |
| 600 | 6 | 20 | do. do. | do. (*g*) |
| | | | *Stephenson Lamp, without inside glass cylinder—2 inch gauze.* | |
| 500 | . . | 7 | No shield, | Exploded. |
| 600 | . . | 9 | do. | do. |
| | | | *Small Scotch Gauze Lamp from Blantyre—2¾ inch gauze.* | |
| 600 | . . | 3 | No shield, | Exploded. |
| 600 | . . | 6¾ | Three inch by six inch, | do. |
| 600 | . . | 3 | Shield on the return side, | do. |
| | | | *Large Scotch Gauze Lamp—3½ inch gauze.* | |
| 600 | . . | 1½ | No shield, | Exploded. |
| 180 | . . | 5 | do. | do. (*h*) |

**Safety Lamp Experiments—Continued.**

| Velocity of the air, in feet, per minute. | Time. Minutes. | Time. Seconds. | Position of Shield. | Remarks. | |
|---|---|---|---|---|---|
| 600 | . . | 1 | Shield $2\frac{5}{8}$ inch by $5\frac{1}{2}$ inch, . . . . . | Exploded. | |
| 600 | . . | 6 | Shield up to the top of the gauze, . . . . . | do. | (*i*) |
| 600 | . . | 11 | Shield whole height of gauze on intake side, . . | do. | (*h*) |
| 600 | . | 8 | do. do. do. . . | do. | (*h*) |
| 600 | . . | $1\frac{1}{2}$ | Shield whole height of gauze on return side, . | do. | |
| 600 | . . | 8 | do. do. do. . . | do. | (*i*) |
| | | | *Davy—Teale's Jack Lamp.* | | |
| 565 | . . | 19 | Cylindrical glass, . . . . . | Exploded. | (*j*) |
| 600 | 1 | 28 | do. . . . . | do. | (*k*) |
| | | | *Davy—Teale's Jack Lamp, with Mr. Smethurst's Chimney.* | | |
| 600 | 3 | . . | Cylindrical glass, . . . . . | (*l*) | |
| | 3 | 15 | do. . . . . | (*l*) | |
| 580 | . . | 50 | do. . . . . | (*m*) | |
| | 2 | 40 | do. . . . . | (*m*) | |
| | | | *Davy—Teale's Jack Lamp, Ashworth & Woolrych—1 inch and $1\frac{5}{8}$ inch gauze.* | | |
| | 4 | 30 | Cylindrical glass, . . . . . | (*n*) | |
| | 14 | . . | do. . . . . | (*n*) | |

**Notes on the Foregoing Experiments.**

(*a*) Red hot; experiment suspended.

(*b*) Red hot; experiment suspended; all proportions of gas and air tried.

(*c*) Copper gauze.

(*d*) Lamp direct out of the pit; had been used all day.

(*e*) Dirty gauze.

(*f*) Smoke gauze covered by a glass shield, to the extent of a quarter of an inch.

(*g*) Smoke gauze covered by a glass shield, to the extent of half an inch; experiment suspended.

(*h*) Standard mesh.

(*i*) Twenty-three mesh gauze.

(*j*) Mr. Pickard's lamp.

(*k*) Glass cracked, but not broken.

(*l*) Gauze red hot for three minutes, suddenly increased the velocity, and the flame passed through and exploded the gas.

(*m*) The glass cracked and broken in two minutes and forty seconds, and the experiment was suspended.

(*n*) The glass shield was cracked up completely, but did not fall away, as some of the glass fused into the wire mesh. The velocity of the air and gas varied in many ways, and the proportions varied, but the gas was not fired when the test was suspended, after fourteen minutes.

On the above experiments, the authors say: "From the above experiments on Davy lamps of various constructions, it will be seen that the results obtained from tests with the same lamp do not agree, and this is accounted for by our inability to regulate the proportions of gas and air accurately. We made many experiments to find what proportions of gas and air formed the most explosive mixture, but our apparatus was not sufficiently delicate to do so. With reference to shields, it will be observed that the ordinary lamp shield is no safeguard at all, and a cylindrical glass shield only becomes such, when it overlaps the top of the smoke gauze to the extent of half an inch or more. So clearly have our experiments demonstated this fact, that Mr. Topping, one of the mining engineers who witnessed them, had a Davy lamp altered to comply with this condition, and then tested, and has now altered, or is altering, all his Davy lamps accordingly."

**Experiments with various other Safety-Lamps.**

| Velocity of the air, in feet, per minute. | Time. | | Description of Lamps Tested. | Remarks. |
|---|---|---|---|---|
| | Minutes. | Seconds. | | |
| | | | Stephenson lamp, | (*a*) |
| 400 | | | Clanny dialing lamp—1½ inch gauze, | (*b*) |
| 620 | | 3½ | Clanny large lamp, do. | Exploded. (*c*) |
| 600 | | 3 | do. do. | do. |
| 600 | | 4 | Clanny small lamp, do. | do. |
| 600 | | 3 | Bainbridge's lamp, | do. |
| 600 | | 3 | do. do. | do. |
| 360 | | | Williamson's lamp, | do. (*d*) |
| 450 | 1 | 38 | do. do. | do. (*d*) |
| 700 | | 2½ | Glover & Cail's lamp, | (*e*) |
| 600 | | 2 | do. do. | |
| 600 | | 3 | Gray's lamp, | Went out. (*f*) |
| 620 | | | Eloin lamp, | Went out at once. (*g*) |
| 600 | | 3 | Mr. Dickinson's Mueseler lamp, | Exploded. |
| 500 | | | do. do. | do. (*h*) |
| 600 | | | Liege make do. | do. (*i*) |
| 1,000 | 3 | 20 | Dickinson's English make Mueseler, | (*j*) |
| 600 | | 10 | Teale's, | (*k*) |
| 640 | | 1 | Pelton lamp, | (*l*) |
| | 1 | 30 | do. | |
| | 3 | 37 | do. | (*m*) |

**Notes on the Foregoing Experiments.**

(*a*) A few tests have been made with this lamp without explosion, but as the Williamson lamp, which is practically of the same principle, passed the flame easily, they were not pursued.

(*b*) Copper gauze. Wick flame extinguished, but the gas continued to burn in the gauze, increased the proportion of gas, and extinguished the flame. Time not taken.

(*c*) Gauze bulged slightly.

(*d*) After the wick flame was extinguished, the gas continued burning at the top of the inside glass cylinder for thirty-three seconds; and in increasing the velocity to four hundred and fifty, the flame passed and exploded the gas; the glass cylinder slightly cracked at the top, but not enough to impair its safety. In the case of some other experiments the gas did not continue to burn, and therefore the flame did not pass.

(*e*) The gas continued to burn in the top of the gauze after the wick flame was extinguished, and the flame passed and exploded the gas.

(*f*) A heavy lamp and an insufficient outlet for the products of combustion.

(*g*) A very sensitive lamp, in fact too much so for use in actual work.

(*h*) Defective disc gauze, not timed.

(*i*) This is the only instance out of the very large number of experiments made with this lamp that it exploded the gas, and being unexpected was not timed. In every other instance the light went out quickly and quietly as soon as the gas fired in the lamp.

(*j*) Did not explode with the few tests made. The proportions of the lamp are similar to the Liege. The glass slightly cracked.

(*k*) The wick light extinguished, but the gas continued burning under the disc gauze, and cracked the glass. Experiment suspended. No other experiment made with this lamp.

(*l*) Inside glass cracked. Light very flickering. More gas added.

(*m*) Light extinguished. Experiments were made with this lamp up to one thousand feet per minute, but in no case did an explosion result. The construction of the lamp is such that a steady light cannot be maintained. It is also both complex in its construction, and heavy.

The following practical results are thus stated:

"1. That the greater the diameter of the gauze the quicker will the flame pass. 2. That in an explosive atmosphere, with the low velocity of seven feet per second, and without coal dust, the Davy lamp, as ordinarily constructed, is unsafe. 3. That whatever may be the height of the tin shield, it is no protection or safeguard against the flame passing; in fact it adds to the danger. 4. That if a cylindrical glass shield is used, as in the "Jack" lamp, and the smoke gauze made so long that the glass shield

overlaps it by over a quarter of an inch, the safety of the lamp is immensely increased, and the flame will not pass until the glass is broken up by the heat, or the double thickness of gauze becomes heated sufficiently for the flame to pass. 5. That a Davy lamp, constructed after the design of Mr. Smethurst's Jack lamp, or Messrs. Ashworth and Woolrych's Jack-Davy lamp, is still safer. 6. That in many cases a Clanny lamp cannot be considered any safer than a Davy lamp, and this remark will also apply to the Bainbridge lamp. 7. That a ventilating current containing a very small percentage of gas, just enough to elongate the flame, and followed by a highly explosive body of gas, is the most severe test that a lamp can be put to, and very few can stand it. This fact is also noticed by the Belgian commission."

Now, if any one can study the foregoing tables without being convinced that the so-called safety-lamps are unsafe, then nothing short of a good baking in an explosion will convince him. These experiments show that the safest kind of a safety-lamp is unsafe; and they sustain me in the most positive manner when I assert that men ought not to be compelled to work with them. A great deal is said about "sudden outbursts of gas" to account for explosions; but I am persuaded that there is more imagination in that theory in most cases than reality. When the real cause of the explosion is the treacherous and dangerous lamp, it is very convenient to fall back upon the "sudden outburst" theory, as it can be, and is, made to cover a multitude of errors.

#### Accidents from Falls of "Black Rock."

The "black rock," to which the men have given the significant name of "man killer," is confined almost wholly to the collieries of the Pennsylvania Coal Company, in Jenkins township and suburbs of Pittston. It overlies the "fourteen-feet vein," and runs quite irregular in every respect. As to thickness, it is sometimes about two feet, and then runs out altogether. When exposed to the action of the air it expands, or "melts," as the men call it, and breaks off close to the solid coal at the face even when it is two feet thick, and when there is not the least sign of a seam or slant of any kind in it; but there are seams and slants in it in many places which make it more dangerous still. In any case, it is a source of great danger to the miners, most entirely through their own neglect, and a number of them lose their lives with it every year. It is to be found in No. 2 slope, and in shafts No. 4 to No. 10, both inclusive, and to some extent in other mines, and the only way to avoid accidents with it is to take it down close to the face of the coal as the miners go along. It very often breaks off when hanging out from the face of the coal only four or five feet, and the oft repeated order of the mine bosses is, that in no case are the miners to allow it to hang more than three feet from the face. But the miners continually disregard this order, and some of them annually pay the penalty of their disobedience with their lives, though it sometimes happens that some other

than the guilty party suffers the penalty, while the guilty escapes unharmed.

Three men were killed by the "black rock" in 1879, and others were severely injured, and it seems passing strange that men will continue to risk their lives under it from year to year, when they know its treacherous nature so well. It is not hard to get down, as there is generally a "rider coal" over it, in which holes can be easily drilled to blast it down. Indeed, there is no need at all that accidents should occur from falls of "black rock," if the miners would but follow the instructions given them by their bosses, and as their own safety depends so much upon their doing so, it seems almost incredible that they refuse, and yet such is the undisputable fact.

If they were required to do this extra work without extra pay for it, still we might suppose their own safety would induce them to do it, but I am happy to say that they are not required to do the work for nothing. The company pay them so much per ton extra on the coal they mine, wherever the "black rock" is required to be taken down. In No. 2 slope, and in No. 5 and No. 6 shafts, five cents per ton extra on the coal mined is paid for taking it down, and this is paid in these collieries whether the rock is thick or thin, and even when it occasionally runs out. In all other collieries the company pay from three to five cents per ton extra, according to the amount of rock the men are required to handle. This shows that the company is doing its duty towards avoiding accidents from this cause at least, and that the men alone must be held responsible for their frequent occurrence, and there is no way to remedy the evil, until rigid discipline is enforced in the mines, so that every man will understand that when he receives an order in relation to his work, it must be promptly and fully carried out.

#### Improvements in Ventilation during the Year.

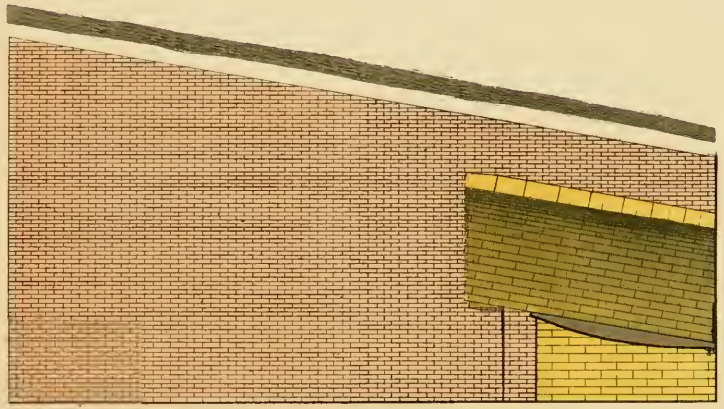
It is with great satisfaction that I notice the improvements inaugurated in the ventilation of the collieries in this district during the year. At this writing, there are but few collieries that are not provided with sufficient ventilation to make them both healthy and safe, and the ventilation in the great majority of them is excellent, and highly satisfactory. Each colliery, with the exceptions which I shall note, is provided with ample ventilation, so far as the quantity of air furnished is concerned, and the only fault that can be found with them is, that the air is not always wisely and well distributed. In opening new gangways and other new working-places, care enough is not always taken to conduct the air along to the face. This is the result of carelessness, lack of forethought, or incompetency on the part of the mining bosses, and there is not a particle of excuse for it. I meet with this difficulty much too often, in collieries even where the quantity of air furnished is very liberal and all sufficient.

Seven new fans were added to the number reported in 1878, so that the

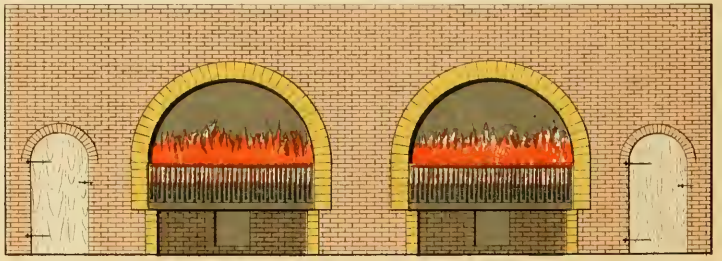
PLAN Nº6.

# PLAN OF THE DODGE SHAFT FURNACE. D. L. & W. R. R. CO. BELLEVUE PA.

PRODUCING OVER 140,000 CUBIC FEET OF AIR PER MINUTE.



SECTION



FRONT VIEW

*Scale ⅛ inch = 1 foot.*

whole number at present in the district is forty-nine. One old fan was replaced with a new one, and two have been removed from one mine to another. Several air-shafts have been sunk, and a large amount of work has been done inside of the mines, for the purpose of utilizing a greater proportion of the air entering them.

The Delaware, Lackawanna and Western Railroad Company still carry the palm for having the best ventilated mines—all of their collieries having excellent ventilation, with the single exception of Tripp's slope. This slope needs attending to, and it is expected that long before the close of the current year, there will be no cause of complaint even here. A new fan, twelve feet in diameter, and three feet six inches face, was erected at the air-shaft connected with the Hampton shaft in place of a furnace, which has increased the ventilation from forty-four thousand six hundred to sixty-two thousand six hundred cubic feet per minute. This fan commenced running on the 27th of October.

The Dodge shaft is also ventilated at present by the fan at the Scranton Coal Company's slope adjoining, which has been lying idle for years. This also is a change from the furnace heretofore used, and has undoubtedly been affected, because it is so much cheaper to run a fan than to keep up a fire in a large furnace. The furnace in this instance produced more air for the Dodge shaft than the fan does, but the fan furnishes ventilation for the Scranton mines in addition to the Dodge. The furnace at the Dodge has produced as high as one hundred and forty-two thousand cubic feet per minute, exerting a horse power of 26.66 to move the air, and I doubt very much that another furnace is to be found in any colliery in the country, that will give so favorable a result. It is a double furnace, having an aggregate grate surface of one hundred and twelve square feet, the depth of the upcast being three hundred and thirty feet, and the sectional area, one hundred and thirty-two square feet. As an example of a first class furnace, I here insert a plan of it. There are two other furnaces—one at the Hyde Park shaft, and the other at the No. 2 Diamond slope—both of them sisters to the one at the Dodge, but neither of them has ever produced the quantity of air that this one has, and the difference is accounted for by the comparative shallowness of the upcasts which makes a great difference in the height of the motive column. A new fan has been put in to replace an old one at the Sloan shaft, the old one being so much worn as to require the change.

A number of the collieries of this company are quite fiery, especially the Taylor shaft, Bellevue shaft, Bellevue slope, Dodge Shaft, Sloan shaft, Central shaft, and Hampton shaft, while there is considerable gas generated in nearly all of the others. But the ventilation is so sweeping, that no explosion can occur unless it be through want of proper distribution, or through some inexcusable blunder. I find the general mine superintendents, Messrs. B. Hughes and T. D. Davies, always careful, and prompt to inaugurate improvements whenever such are needed, and they always manifest a cheer-

ful readiness to comply with all that the law requires, and I am happy to say that W. R. Storrs, esquire, the general agent, as well as the president and directors, always manifest the same disposition. They are all evidently convinced that it is to the interest of the company, as well as for the good of their workingmen, to keep their collieries in their present excellent condition.

The Delaware and Hudson Canal Company, perhaps have done more to improve the ventilation of their collieries during the last three years, than either of the other larger corporations, and they are now entitled to the second place on the list in this respect, thus changing positions with the Pennsylvania Coal Company. Three years ago, their collieries in Carbondale were about as poorly ventilated as it was possible that they could be, but since that time, they have erected three fans there, the third being added last year, to ventilate the five tunnels composing the Coal Brook colliery. Hereafter, there need be no complaint of poor ventilation in the Carbondale collieries, unless the mine bosses fail to conduct the air properly through the workings. There is a very great and agreeable change for the better, and I am very grateful to the superintendents, especially to A. H. Vandling, esquire, for these improvements. There are now only two collieries owned by the Delaware and Hudson Canal Company, in my district, where the ventilation is not satisfactory, the two being the White Oak colliery, in Archbald borough, and the Grassy Island shaft, in Olyphant borough. Neither of these, however, is very bad, nor is either of them good, and I do not expect them to be good until a fan is provided for each.

The Pennsylvania Coal Company have also done considerable, but are more tardy in effecting the necessary improvements than either of the other large companies. One trouble with them is, their persistant clinging to the objectionable, unhealthy, and dangerous system of ventilating collieries successively with the return air passing from one to the other, instead of ventilating each colliery separately with "pure air," as the law requires. It is very fortunate for them that neither of the collieries where this is done is very fiery, or they could not be allowed to work them at all until this evil was remedied. They have extended two of their shafts down to the Marcy vein during the year—No. 4 and No. 11 shafts—and the probability is, that there will be gas enough in this lower vein to oblige them to abandon this dangerous system.

They have some collieries, however, in excellent condition as to ventilation, notably, No. 4, No. 7, No. 8, new No. 9, new No. 10, No. 13, and Law shafts. All their other collieries can be very materially improved, and must be improved before they can be rated as first class, though none of them are very bad. They have erected a new 17.5 feet diameter fan on an air shaft sunk for No. 7 shaft, in Jenkins township, which commenced running October 21, 1879; and another of the same size was put in at the new No. 9 shaft, which commenced running August 2, 1879. These are improvements inaugurated during last year, and were much needed.

Of the smaller companies and operators, I have two to report who have replaced furnaces with fans during the year. Messrs. Jones, Simpson & Co., have put in a twelve feet diameter fan at the Pierce colliery, in Archbald borough, and Messrs. William Connell & Co. have replaced their furnace with a fourteen feet diameter fan, which commenced running October 28, 1879. The Butler Coal Company have replaced a six feet diameter Patterson fan with a sixteen feet Guibal fan, and the little one has been removed to the Twin shaft, Pittston Coal Company, and the Hillside Coal and Iron Company have removed their fan from the Powder Mill shaft, in which the coal is exhausted, to a new air shaft sunk for the Spring Brook tunnel.

All the miscellaneous collieries are in a satisfactory condition at present, excepting the following: Jermyn's shaft and slope, Jermyn borough; Eaton colliery, Archbald borough; Filer colliery, Winton borough; Greenwood colliery, Lackawanna township; Hillside colliery, Pleasant Valley borough; Columbia mines, Pittston township, and the Beaver mines, Pittston borough. The first three named, the Greenwood, and the two last named, are the only very bad ones, and each of these must receive particular attention during the current year. The larger number of the collieries of the small operators, are in very good condition as to ventilation.

Taking the whole of my district, I think that it can be safely said, that the progress made during the year in bringing the condition of the collieries up to what it should be, is highly encouraging and satisfactory, and the work accomplished can be taken, no doubt, as an assurance that what is still wanting, will be done in due time.

#### Prosecutions for Violations of Law.

It is one of the most unpleasant duties of the position of an inspector, that he feels compelled, in certain instances, to enter criminal proceedings against mine bosses or workingmen, for violations of law. I have often felt that I would prefer to suffer the penalty myself than do this, if I could escape my oath-bound duty by doing so. Whenever I have been forced to prosecute, I have done it "with malice towards none and charity towards all," and have never asked the courts to inflict any but a nominal punishment. But I have been sorely grieved at the course pursued by the operators, superintendents, and workingmen, in defense of the unfortunate parties prosecuted. I do not complain at their availing themselves of all legal and honorable means in defense of the accused, but when they assail the motive of the inspector, and attribute his action to a feeling of spite and a desire for revenge, in retaliation for some real or imaginary wrong they may be conscious of having perpetrated against him, they make the cross a very heavy one to bear. I cannot account for this, only as a verification of the old maxim, that "The guilty fleeth when no one pursueth him." But it grieves me that any one, who claims an intimate acquaintance with me, can imagine it possible for me to be capable of indulging in a low and mean desire for retaliation and revenge; for I thank God that

He has enabled me to control myself to such an extent that I can truthfully say that I am a perfect stranger to such an evil passion. I cannot help it if men refuse to believe this, and I am very sorry that it is so glaringly apparent that my traducers must judge of me by themselves.

It is a very painful and discouraging fact, that all parties, as a rule, from the highest official connected with the mining of coal down to the door-boys and slate-pickers, are leagued together to oppose an honest and impartial enforcement of the law. But so long as I hold this position, I purpose to honor my oath in the performance of my duties, unpleasant as some of them are, believing that the safety of the workingmen's lives, and also the safety of the property of the operators, is best secured by such a course. During my term, I have experienced all of this undeserved opposition, to some extent, in the few prosecutions that I have instituted, but never so bitter and determined as during last year.

There were six cases brought to the attention of the courts, for violations of the mine ventilation law, during the year—two in Luzerne and four in Lackawanna county. The first case was that of Peter P. Daly, a mine boss at the No. 4 shaft, Pennsylvania Coal Company, Jenkins township, who was charged with sending a large number of workingmen down the shaft, on the morning of the 30th day of November, 1878, on a carriage that had none of the safety appliances required by law. The case came up before the grand jury in the April session, but the bill was ignored on account of the death of the defendant, who was killed by an explosion of gas, through his own blunder, on the 9th of January, 1879.

The second case was that of Thomas Monies, an engineer at the same colliery, who was charged with hoisting the carriage, loaded with men, to the sheeve wheel, instead of lowering it down the shaft. On the carriage striking the sheeve wheel, the rope parted, precipitating the carriage, with its human freight, on its way down the shaft, but it was fortunately caught on the fans at the top, which had not been removed. The carriage being hoisted above the guides, the safety catches could not act. Monies was indicted March 27, 1879. The case came up for trial in the April session, when the defendant entered a plea of "Guilty as charged in the indictment," and was let off with a nominal sentence of one dollar ($1) fine and costs. Mr. Monies bore an excellent reputation, and had the sympathy of a large circle of friends, and I am happy to have good cause to believe that both he and his friends fully justified my proceeding against him, and that he was conscious that I was only faithfully doing my duty, and would not have me do otherwise. His conduct was so honest and honorable that I would willingly have spared him if it had been possible.

The third case was in Lackawanna county, and was that of Enis McDonald, a breaker boss at the Spring Brook colliery, Hillside Coal and Iron Company, Lackawanna township, charged with ordering a trap door opened in the top of a box inclosing the pony rolls, through which Thomas Garrett, a slate picker, fell and was drawn into the rolls and was crushed to

death. This sad accident occurred November 22, 1878. McDonald was arrested, and was brought before Alderman I. L. Post, Scranton, November 26, 1878, where he demanded a hearing, but was held to appear at court. The grand jury found a true bill against him May 5, 1879; and the case came up for trial August 27, 1879, when, in consideration of the fact that the defendant was a cripple with a large family and very poor, he was let off with payment of the costs of the prosecution. Had the case been forced on, he could not have escaped imprisonment, and as I did not desire to send him to prison, he was allowed to escape that penalty.

The fourth case was that of Thomas Kelley, a footman at the School Fund slope, Hyde Park, who was charged with riding up the slope on a trip of loaded cars. He was arrested May 26, 1879, and, waiving a hearing, gave bail before Alderman I. L. Post, to appear at court. August 29, 1879, he came into court and entered a plea of guilty as charged in the indictment, and on the 6th of September was sentenced by President Judge, the Honorable John Handley, to one hour in prison, one dollar ($1) fine and costs of prosecution.

My only object in prosecuting in this case was to break up this dangerous practice of riding up slopes on loaded cars. The law wisely prohibits it, and, in addition to that, I had issued a special order against doing it in this slope, and also against traveling up or down the slope when it was working. One old man had been killed there, but that was not enough to put an end to the practice, hence I had no other course left me but to prosecute the first man whom I found violating the law.

The fifth case was that of William Edmunds, a footman on an inside slope in the Jermyn shaft, operated by John Jermyn, esquire, Jermyn borough. He was charged with the same offense as Kelley, and was brought before Alderman I. L. Post, on the 17th of July, 1879, and backed by John Jermyn, Mr. Barger, his confidential clerk, and all his bosses, the young man employed counsel and demanded a hearing. The fact was disclosed in course of the hearing that Edmunds was hired to do this dangerous thing in direct violation of law, by Robert Carter, the mine boss in charge of the colliery, and that he was compelled to ride up and down upon every trip made on that slope, in order to attend to the head as well as the foot of the slope, thus exposing the young man's life to constant danger, for the sole purpose of saving the wages of another man. Notwithstanding the prestige brought to bear against the case, of an able attorney, and notwithstanding the unfounded assertion of Mr. John Jermyn and his bosses that it was absolutely necessary for the young man to ride up and down upon every trip on that slope, the alderman held him to bail for his appearance at court.

In my travels through the collieries I had come upon a number of cases of this kind, where young men were obliged to attend both the head and foot of slopes, but the practice was discontinued at once in every instance but this one at my request, and as I only desired to have the law complied

with, I had no occasion to prosecute in any case but this, and I tried to avoid doing so in this case also.

While at the colliery on the 28th of June, and as I was passing down the slope, I saw Edmunds riding up the slope on a loaded trip between two cars. I at once called the attention of Robert Carter, the mine boss, to the matter, and ordered him to have it stopped, expecting that would be the end of it. But after examining the workings on the west side of the slope I returned, and found Edmunds again riding up on a loaded trip. I then resolved to order him to stop doing so myself, which I did. I explained the law bearing on the matter to him, and how he was endangering his life, and how he was putting himself liable to prosecution, which must result in his being fined and imprisoned, and I concluded by ordering him, in the most friendly manner, not to ride up the slope on loaded cars any more. He listened attentively to all I said without saying a word in reply, but when I got through speaking to him, he signalled to hoist the trip, and jumped on again in defiance of the law and of my order, and in my very presence. Had he obeyed the law at my request, there would have been no prosecution, but under these circumstances I had no other course to pursue. I was forced to cause his arrest, or allow the law to be trampled upon, and I did cause his arrest as before stated.

When it was disclosed, however, at the hearing before the alderman, that he was hired to do this, I felt that Robert Carter and John Jermyn were really more responsible for the crime than he was, but as I hoped that this one arrest would put a stop to the evil, I made no other arrests at that time, but I soon found that my hope was vain. On the 14th of August I visited the colliery again, and to my great surprise I found Edmonds still riding up and down the slope, and attending to the head and foot as of old. Finding the law so utterly set at defiance, I returned home, and on the 16th of August I caused the arrest of Robert Carter, the mine boss. But this did not end the mischief. The boy, under the instruction of John Jermyn and Robert Carter, continued to defy the law and the inspector, until the case was tried and he was found guilty.

The grand jury found a true bill in the case July 29, and the case came up for trial August 29, 1879, when a verdict of guilty was rendered, and the sentence followed on the 6th of September.

The law is so plain and explicit in relation to the offense charged against Edmunds, that it seems impossible for any one to be so dull of comprehension as to misunderstand it. The law says: "That any miner, workman, or any other person, who shall ride upon a loaded car or carriage in any shaft or slope, or on any plane in or around any coal mine or colliery, &c., every such person shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by imprisonment and fine, at the discretion of the court." In this case, the fact of Edmunds riding on loaded cars up the slope was not denied, but an attempt was made to justify the act under the

plea of necessity, Mr. Jermyn going so far as to intimate that it was impossible to operate that slope, without having Edmunds or some one else riding up and down upon every trip. But it was proven, to the satisfaction of the court and jury, that the only necessity for this, was the saving of another man's wages.

Another point which Mr. Jermyn labored hard to impress the jury with was the unfounded assertion that the prosecution was instituted by me out of spite and enmity against him. I was very much pained at this feature that was dragged into the case, for I certainly did not deserve any such base treatment at the hands of Mr. Jermyn of all the men with whom I have official relations; and no man can be so conscious of this fact as John Jermyn himself, for he knows that he has received nothing but unmixed kindness at my hands. If I had been capable of the spite attributed to me, the opportunity had not been wanting to strike a much more direct blow at Mr. Jermyn than by causing the arrest of one of his employés; but the fact is that if I have erred at all in my dealings with him, it has been in the exercise of too much leniency. In any event, I have never had the least desire to harm him; but I must be allowed to strive to do my duty, even where he is interested, and that I purpose doing regardless of consequences. Though the love of approbation is well developed in me, and though I would highly appreciate the good opinion of John Jermyn, and every other respectable man, still I cannot forfeit my own self-respect by neglecting my duty in order to secure it.

The sixth case was that of Robert Carter, the mine boss, which, through the earnest solicitation of Mr. Jermyn, was settled by his paying the costs. As I had gained the point for which I was contending in the suit against William Edmunds, and as Mr. Jermyn assured me that the law henceforth would be respected, and that he would give me no further trouble, I had no object in forcing Carter's case to trial. But had I been the spiteful and vindictive being that Mr. Jermyn would have the people believe me to be, I would have taken a very different course.

### The Butler Mine Fire.

The Butler mine fire has now been raging since early in the year 1877. At the close of that year, when I last reported its condition, it had burned over an area of about five acres; but it has now spread over an area of about twenty-three acres, as shown by the carmine plot on the accompanying map of the colliery, which is a map of the Marcy vein immediately underlying the old workings where the fire is located. In the winter of 1877–8 an open cut from the surface was made all the way from the outcrop on the east and north to the outcrop on the south, a distance of about three hundred and fifty yards, with the exception of a section in the deepest part, which was tunneled. The open cut is twenty feet wide at the bottom, and ranges from twelve to forty-five feet in depth. The fire has now extended over all the plot thus cut off by the open cut and tunnel, but it is

believed that it can penetrate no further, the only doubt being as to its crossing the tunneled part of the cut. There is no doubt but its progress is wholly checked where the open cut is made, but there have been grave doubts, and they are not wholly dispelled yet, that the fire would cross at the section tunneled. When the fire reached the tunnel the intense heat caused it to cave in, and the company were obliged to flood it with water; and it was very doubtful for a time which of the elements would conquer. Water is being applied still, and the war of the elements is still raging with more or less fierceness, and it is uncertain at times yet which has the advantage, though it is believed on the whole that the water is master of the situation. There is danger, however, of letting off the water too soon, and it is impossible to say when it will be safe to do so, as the fire sometimes seems to die out and then burst out again with renewed force. It has cost the company nearly twenty-five thousand dollars to confine it within its present bounds.

The whole twenty-three acres are now overrun by the fire, but it must burn itself out within its present limits unless it crosses the tunnel—but if that should occur, no one can tell where it would end. The heat of the fire is so intense, that the forty feet strata of rock intervening between the burning vein and the Marcy vein below, is so hot in the latter vein in some places, that one can hardly bear his hand on it. The temperature in the lower vein up to a short time ago, was over one hundred degrees Fahrenheit, and the men worked there in that hot air as nearly nude as possible. There was no lack of air, but it had to travel through this hot region to reach the face of the workings, and it was too hot for men to work in it. When I learned these facts, I at once demanded an air-shaft sunk at the face of the workings, and outside of the line of the fire, so as to provide fresh and pure air for the men from the surface, instead of air conducted to them through the hot region under the fire. The superintendent at once laid the case before the directors of his company, and with their permission, he put down the shaft as suggested, and has since sunk two others, and his men at present get fresh and cold air to work in.

S. B. Bennett, esquire, the superintendent, has done himself great credit in acting so promptly in the matter, and his cheerfulness in doing what was asked of him, is very pleasant and agreeable for both the inspector and himself. If all superintendents would but take the interest in the welfare, and comfort of their men that is manifested in the conduct of Mr. Bennett, no mines would long remain in an unsafe or unhealthy condition.

#### New Collieries Opened and Under Way.

The company which has taken the lead in opening new collieries, and in developing new fields for coal production during the year, is the Pennsylvania Coal Company. They have opened a new shaft at Hughestown borough, known as the New No. 9 shaft, which is sunk to the "fourteen feet" vein. This takes the place of the old shaft of the same number, which has

PLAN No. 7.

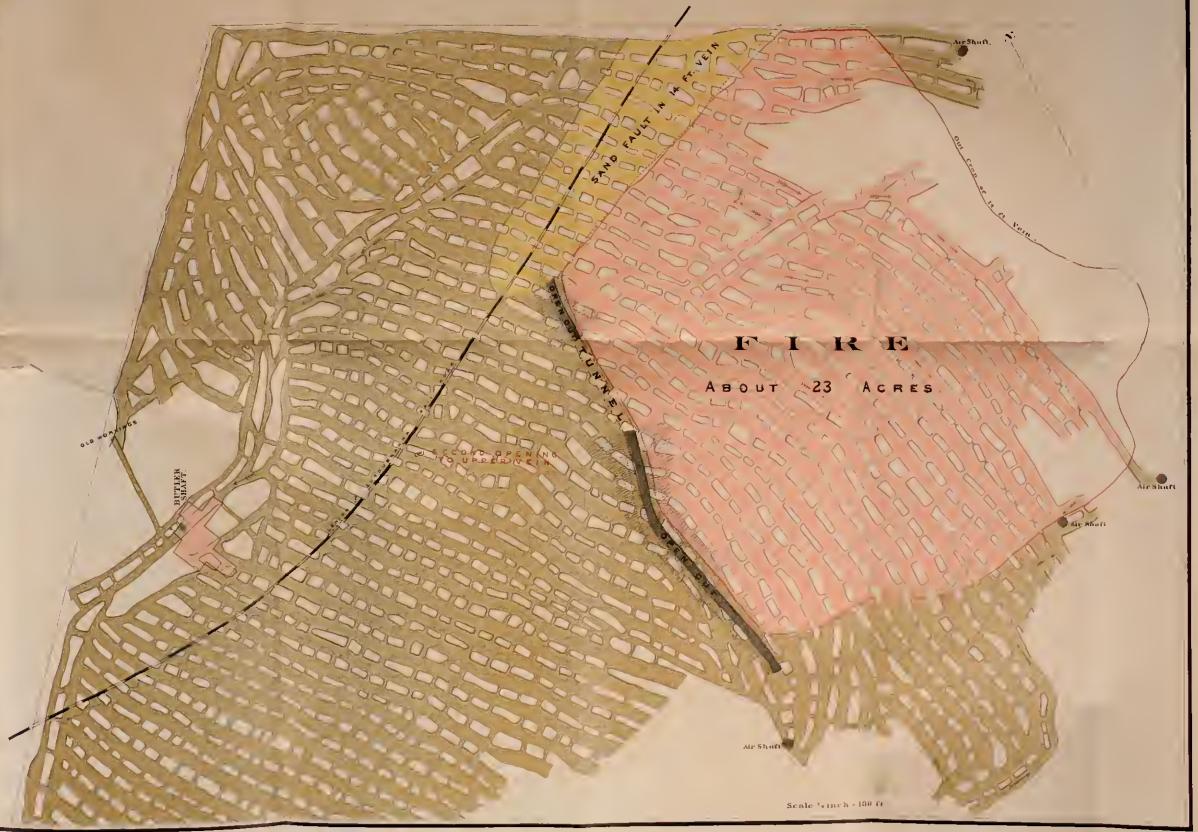
# PLAN

*Showing the*

# BUTLER MINE FIRE,

*PITTSTON, PA.*

Burning since June, 1877.



been abandoned. They are also developing the Marcy vein at No. 4, and No. 11 shafts, in Jenkins township. But the main enterprise of the year, was the sinking of the Barnum shaft, on what is known as the Waddell farm, near Pittston. This shaft is one hundred and seventy-three feet and five inches in depth, from the top of the stone work at the surface, to the bottom of the "fourteen feet" vein, and is forty-seven feet long by twelve feet wide in the clear, giving a sectional area of five hundred and sixty-four square feet. It is to be divided into six compartments, one, eight feet five inches by twelve feet for an upcast, four hoisting ways, six by twelve feet each, and a pump-way, twelve feet square.

The sinking was commenced in October, 1878, by the company, who drove it down 36.5 feet by day labor. The balance of the work was done under contract, by James C. Smythe & Co., between the 1st of July, 1879, and January 1, 1880. The nature of the strata penetrated by the shaft is as follows: First, There is earth, slate, and rock for 49 feet and 5 inches, when a vein of coal three feet thick is met with; then there is 63.75 feet of fire clay and rock to the "seven feet" or "checkered" vein, which, at this point, proves to be 11.33 feet thick, and is said to be of good quality; then there is 27 feet and 11 inches of rock to the top of the "fourteen feet" vein, which, however, at this point is only 9 feet thick.

No timber is yet on the ground for the breaker, and it is, therefore, rather premature to venture any prediction as to what its capacity will be when built, but it is not likely to be less than one thousand tons per day. The time when shipping of coal will commence cannot at present be approximated, as there is a vast amount of work yet to be done before the colliery will be ready to commence operations; and the dispatch with which the work is driven will depend, in a great measure, on the demand for coal. They must make their connection with their second opening, which is eight hundred feet distant in both veins, and must drive their gangways, &c., in each vein before they can do much in the way of shipping coal.

The second opening is another new shaft eight hundred feet distant from the main shaft which is now being sunk, but is not yet over half way down. There is a large tract of land to be worked through these shafts; but the number of acres cannot be stated, as there are other collieries that will take in more or less of the territory. But it is very evident that when this colliery is completed and opened, it will be the model colliery of the company.

The Butler Coal Company is about to sink a new shaft, and the Lehigh Valley company is commencing to sink a shaft on their property adjoining the Butler colliery, in Pittston township; and the Pennsylvania Anthracite Coal Company are also sinking a shaft at their Greenwood colliery, in Lackawanna township, but neither of these are yet anywhere near the coal.

### An Association of Mine Bosses Recommended.

There are about one hundred and fifty mine bosses, mine superintendents,

and outside foremen in this district, and many of them have no experience outside of what they have gained in the collieries under their immediate charge. Among so large a number, there are some that are well qualified for the high and responsible positions which they hold, but the majority have a great deal to learn before they can expect to be classed as competent and experienced mine bosses. Perhaps it may be said that all of them are possessed of some of the many qualifications necessary, and as men, that nothing can be said against them; but I find that the number who are well informed in the science of mining and ventilation are very few and far between. I am not to be understood as classing them all so, for that would be doing gross injustice to a respectable number of them. The truth is, that they range from very competent men down to the very ignorant, the greater number being below the medium. The advanced class will no doubt admit that there is much for them even to learn; and no doubt their experience has taught them that they must continue learning day after day, month after month, and year after year, if they hope to cope successfully with the ever-recurring new difficulties and problems that spring up in their business. And if that be so in relation to the more advanced class, every one must admit that it is much more so in relation to such as are inexperienced and unlearned.

There are no opportunities offered in the coal regions for these men to improve themselves, but I believe they can make the opportunities, to a certain extent, if they will. They can form an association among themselves for mutual improvement, by means of which they can acquire a large amount of information that would not only be a great benefit to themselves, but could not fail to make their services of much greater value to their employers, and they would thus, also, be far better qualified to insure the safety of the workmen under their charge. Such an association would enable them to consult with one another, and give them an opportunity to learn from their more experienced associates. They should meet as often as convenient for consultation, and for the free discussion of questions brought before them; papers should be read and discussed on subjects bearing directly on mining, on ventilation, on haulage, on drainage, &c., &c.; experiments on various matters ought to be inaugurated; and the several collieries in the district should be visited, so that each one may profit by the different systems adopted for all kinds of work. The association ought to have a complete set of chemical apparatus, and all kinds of instruments necessary to enable its members to make their investigations thorough and exhaustive. An expert in chemistry might be engaged as an instructor. A number of good civil and mechanical engineers might also be admitted into the association with great profit to all the members, as well as to the coal business generally.

It cannot be denied but there is a fearful waste of coal by the present system of mining and preparing coal for market, and it seems to me that an association of this nature might do great good to reduce this waste.

The waste through blasting is very great at best, but their are hundreds of instances, where the blasting is done by incompetent miners, where the waste is enormous. At present this is not felt, and because it is so general, it may be but seldom noticed. The coal in the ground seems at present, to the casual observer, to be inexhaustible, and no one seems to care how extravagantly it may be wasted in the process of mining. But the time will soon come when this prodigal waste will be sorely felt, and it would seem to be the part of wisdom and economy in us to stop the waste while we can. I have no doubt but fully one third of the coal in the ground is wasted in blasting, and the owners are thus being robbed of the one third value of their property, and it seems very strange to me that they do not arouse themselves to look after this loss.

When a man hires a builder to put up a house for him, he is not willing to furnish him one third more material than is necessary to build with, and he will be very careful that he will engage no builder who will waste material at such a rate. The farmer is very careful that the party who threshes his grain for him will not waste one third of it in the process; or, if he hires a man to dig a field of potatoes, he will not suffer him to leave one third of the crop covered up and lost in the ground. Then why should owners of coal lands allow this fearful waste of coal of which I speak, if there is a possible way of preventing it? They are being despoiled of their wealth, and though they may be able to afford it, yet their heirs must suffer by it. But I believe that experiments would demonstate that there is, not only a possible, but also a practical way, to stop a great deal of this waste, and if an association was formed and the matter tested, I have no doubt but it would result in much good to all concerned.

Suppose, for instance, that the experiment be tried of undermining the coal before blasting. Let one or more good pick-men, used to "holing" or mining, be selected to work a chamber on this system, say for a month, and select the same number of men, of good judgment in blasting, to work another chamber for the same length of time, and at the end of the month let the cubic contents of the respective chambers be taken, and ascertain the difference in the amount of coal produced by the parties from the same space. It will be found that the production of the pick-men will be very much greater per cubic contents than that of the blasters; and the coal will be cleaner and in better condition in every respect, and will turn out more coal per car load after passing through the breaker. Then, the cost of mining it, as to powder, will be reduced five to six hundred per centum, while the accidents from falling of roof and coal would rarely occur; there would be no tearing of the roof by blasting out from the solid, no blasting of props out of place, no matter how close they may be stood to the face, and the danger from blasting would be nothing compared with the present system, and mines filled with powder smoke would never be found.

The majority of our present miners and mine bosses will probably assert

that our anthracite coal cannot be mined in this way; but I have seen it done— I have done it myself. Twenty-five years ago, the coal mined in the Lackawanna valley was undermined altogether before blasting, and there are some of the old miners who still do it, and I am informed by them that they save nearly as much in powder as many of their neighbors earn altogether. And this has been successfully done in the hardest kind of coal, and when it stuck to the bottom slate and to the roof as if it were cast there. The subject is certainly important enough to demand investigation, and I think that the mine bosses, mine superintendents, and mining engineers are the proper parties to inquire into it, and they can do it in no way better than by forming themselves into an association which will enable them to act in concert.

Then again there is an immense waste in the present system of preparing the coal for market, especially in the breaking of it into the several sizes. It is very doubtful whether the rolls used at present are the best that can be devised for the purpose of breaking the coal, and, if the matter was investigated, it is my opinion that they might be very materially improved. This again might be tested by an association such as I recommend, and there are many other important matters that the association might experiment upon and investigate with great profit to themselves and that of their employers.

It would require a certain sum of money, as a matter of course, to establish and carry on such an association successfully, and the members would require some time to make the investigations and experiments suggested; but I feel very positive that the money and the time would be freely appropriated by the companies and operators if the matter was properly presented to them, and I am very certain that the increased efficiency of their officials would repay them for the investment many times over.

There are a number of excellent men that could lead in the matter, such as B. Hughes and T. D. Davies, Esquires, mine superintendents of the Delaware, Lackawanna and Western Railroad Company; Andrew Bryden, Esquire, mine superintendent of the Pennsylvania Coal Company; Andrew Nicol, Esquire, of the Delaware and Hudson Canal Company; John R. Davies, Esquire, Roaring Brook Coal Company; C. F. Mattes, Esquire, Lackawanna Iron and Coal Company, and some others. Of the mine bosses, the following would be very useful members: Messrs. John T. Williams, John Hale, G. M. Williams, John B. Law, Benjamin Reese, Finlay Ross, Morgan Harris, Lewis Roberts, Frank Zimmerman, Reese G. Brooks, Joseph D. Lloyd, and others; and of the mining and mechanical engineers: Messrs. John Snyder, W. A. May, Edward Jones, Thomas Sayers, William Monsey, C. T. Conrad, Austin Moore, C. Brinckerhoff, and some others, would be excellent men; and so far as I am personally concerned, it would give me great pleasure to do anything in my power to establish an association of this kind in my district, for I am very positive

that something of the kind is needed, and, if it were established that, it could not fail to do great good. This has been my only object in recommending it.

### Mine Inspectors' Report.

During the last two years a very large inquiry has been made for copies of the Mine Inspectors' Reports by men connected with the mines as officials in some capacity or another, and also by a large number of workingmen. I think some way should be devised to meet this demand. The number of copies allotted to the inspectors does not begin to satisfy the demand for them, and I find myself very much puzzled as to the best way to distribute the few I get. I have had over one thousand applications for copies during last year, and an equal number in 1878, but I was obliged to turn more than nine tenths of them away empty-handed, because I had none to give them. I submit that some provision ought to be made for a free distribution of these reports among the miners, so that they may inform themselves as to the causes of accidents, and of the advice given them by the inspectors to avoid accidents. If there is any class to be benefited by our reports, there is no doubt but the miners and the mine bosses compose that class. I suggest, therefore, that a cheap edition be printed for distribution, so that those who are inquiring for them can be provided for.

### Explanation of the Following Tables.

Tables Nos. 1, 2, and 3, constitute a complete list of all the accidents of every description that occurred in the district during the year. The accidents are divided into three classes. 1. Those resulting in loss of life. 2. Those resulting in serious injury to persons, disabling them to resume their work for a considerable length of time. 3. Those that resulted in slight injuries, disabling the parties only for a few days. It has been insinuated that our lists of accidents are imperfect, and do not include all that occur in and around the mines, but I desire to say that if any has escaped notice they have been so insignificant that it would be absurd to make a record of them.

Table No. 4 shows the number of persons killed and injured in the district during the last six years, and the several causes of the accidents are charged with the proportion due to each. In glancing at this table it will be seen that three hundred and seven persons were killed in the district in six years. For the first half of the six years the average per annum is fifty-eight and one third, and for the last half the average is forty-four and one third per annum, which shows a reduction of nearly twenty-four per cent. in favor of the last three years over the three years previous. The average for the six years is fifty-one per annum. In one respect these figures are in a measure favorable and encouraging, and still they are terrible to contemplate, and call loudly upon all who are in any way responsible

to redouble their exertions to reduce their number still further. Every official, and every workingman and boy in and around the mines, have a great deal to do to attain this; and no man or boy can escape his share of this responsibility, and no one should attempt to shirk it, but every one should do all in his power to avert accidents. If every man and boy would but resolve that he will do his part, and exercise reasonable precaution against accidents to himself even, the result would astonish everybody. And if men will but guard against accidents to themselves, they will be guarding against accidents to those around them at the same time. The number of persons injured during the six years is seven hundred and eight; the number of widows is one hundred and seventy-four; and the number of orphans six hundred and forty.

Table No. 5 gives the number of tons of coal mined annually in the district for the last six years. It has been doubted by some that this tonnage, as given by the inspectors, is correct, and I think it proper to state in this connection, that so far as I am concerned, the figures are from the books of the companies and operators at the collieries, and are, therefore, absolutely correct. There is no possibility of an error in those figures, unless it may be in the quantity consumed at home, which cannot be ascertained accurately, and is only estimated. This table also gives the number of persons employed, the ratio of coal mined per employé, the ratio of coal mined for each life lost, the ratio of coal mined for each accident, and the ratio of persons employed for each life lost during the six years.

Table No. 6 gives the number of persons killed and injured during last year at each colliery in the district; and also the number of days worked, the total number of persons employed, the number of tons of coal mined for each person employed, and the number of tons mined for each life lost, with the quantity of powder used at each colliery during the year. From this table it will be observed that the Delaware and Hudson Canal Company's mines have by far the best record in relation to accidents of any in my district. This is accounted for in the fact that propping is much better attended to under this company than any other under my charge, and also to the fact that a better quality of timber is provided by this company than the others. The cause is not that they have better and safer roof as many suppose, for that is not the fact. Some of the most dangerous roof in the Lackawanna Valley is to be found in the Delaware and Hudson mines, but it is well taken care of, and accidents rarely occur from falls of roof, which is the chief cause of accidents in our mines, only one life being sacrificed to this cause with them during the year. The superintendents, mine bosses, and miners deserve credit for this, and it gives me great pleasure to accord it to them.

The Delaware, Lackawanna and Western Railroad Company is next on the list for safe working, but I have been considerably disappointed that the record for last year is not more favorable. During 1878 the officials of this company had taken the matter in hand of providing a better quality of

timber for their collieries, but their good intentions have not held out, and much of the timber used during last year was too small and light. The miners, as we descend the valley from Carbondale, become more and more careless in propping; and they are not nearly so careful of the roof around Scranton as they are in the upper end of the valley. The Delaware, Lackawanna and Western Railroad Company's miners are not the worst in this respect, however, but still they are far from being the best.

The miners of the Pennsylvania Coal Company use less timber, as a rule, than those of either of the larger companies. But the roof in the majority of the collieries of this company is very good. The mines at Dunmore, and one or two others are exceptions, where the roof is not extra good, but it is on the whole, well taken care of. The great destroyer of life under this company, is the "black rock," of which I speak more extensively elsewhere. The officials are doing all that can be expected of them, to induce the miners to attend to this treacherous rock, with the exception of enforcing more rigid discipline to compel their men to obey orders. The ratio of coal mined for each life lost, is lower under this company than under either of the large corporations, and also lower than the average of the smaller companies.

Table No. 7, consists of a classified enumeration of the employés, both inside and outside, at every colliery that was in operation during any part of the year in the district. This table might be studied with profit by mine officials, but I have not the time or space to point out the lessons that may be learned therefrom.

Table No. 8, is a statement giving the amount of steam power, and machinery used at each colliery to hoist the coal, and prepare it for market, for pumping, and for ventilation. The aggregate amount of machinery is very great, and the care with which it is used, as a rule, is very commendable. I have felt very great anxiety in relation to this part of my charge, especially as regards examinations of steam boilers. It requires continuous correspondence to have the boilers examined as required by law, and even when reports are received, there is serious doubt in many instances as to whether the examination has been made by a competent person or not. The inspectors of other districts have strongly advised separate inspection of steam boilers by expert boiler makers, commissioned by the State, and I most heartily agree with their recommendation.

Table No. 9, is the most elaborate of the series. This has given me an immense amount of labor, as it is compiled for the most part from the monthly air reports from the several collieries. My object in compiling it is to show, as nearly as possible, the exact condition of every colliery in the district as to ventilation, and I have attained my object to a very satisfactory degree. Had such a table been compiled three years ago, so as to compare the condition of the mines then and now, it would show a very large improvement.

The means used to produce the ventilation at each colliery is given, and

the quantity of air produced thereby. The plan of distribution, or the manner of conducting the air through the workings is plainly indicated in the number of currents or splits into which the air is divided, and the quantity of air in each split. The number of persons employed in each current is also given, and the number of cubic feet per minute of air provided for each person in each split. By comparing the quantity of air at the face of the workings, with the quantity at the inlet, every mine boss will see what proportion of the air provided for the colliery is utilized, and most of them will find that they are called upon to look after the leakages, so as to conduct the highest percentage possible of the air entering the mine to the face of the workings. The showing for a large number of the collieries is fair in this respect, and yet there are but few which cannot be improved, while a large number on the other hand, are very discreditable to those in charge. In several instances, barely fifty per centum of the air is utilized, while in some collieries the per centage is still lower.

The only collieries having less than one hundred cubic feet per minute for each person employed, are the following: Tripp's slope, Delaware, Lackawanna and Western Railroad Company; White Bridge tunnel and White Oak tunnel, Delaware and Hudson Canal Company; Greenwood and Sibley collieries, Pennsylvania Anthracite Coal Company; Fairlawn slope, Messrs. Hosie, Archbald & Hosie; Eaton colliery, Messrs. Jones, Simpson & Co.; and Jermyn's shaft, John Jermyn, esquire—the last named being far below the very low minimum provided for by law. These collieries need attending to, and it is to be hoped that the proprietors, or their agents, will lose no time in making the necessary improvements.

In relation to the quantity of air credited to the collieries of the Pennsylvania Coal Company, consisting of No. 2 and No. 4 slopes, and No. 4, No. 5, No. 6, No. 7, and No. 11 shafts, all located in Jenkins township; and also Stark shaft, No. 12 shaft, and Law's shaft, in Pleasant Valley borough, it is almost impossible to get the exact figures. So much of the ventilation in these collieries consists of the return air passing from one to another, and the air is so scattering in its passage, that a true and correct measurement cannot be had. Hence the figures in the table relating to those collieries are to be understood only as giving the quantity of air indicated by them at the points named, and not as indicating the true quantity of "pure air" provided for each colliery. A large percentage of this air is measured two, and even three times. This system of ventilation is very objectionable, as I have stated elsewhere, and I am striving all I can to correct it, but I am sorry to say that I meet with persistent opposition on the part of the superintendents.

It is not necessary to inform such as thoroughly understand ventilation, that mines having the greatest amount of air are not always the best ventilated, but the inexperienced is apt to think such necessarily to be the case. To such it may be well to explain, that where gas is freely generated a colliery may have an immense volume of air traversing the work-

ings, and yet that same colliery to be poorly ventilated, while another mine, generating no explosive gas, may be splendidly ventilated with less than one quarter the quantity of air. No fiery mine can be considered well ventilated, unless it is provided with a sufficient volume of pure air to dilute the gas as it evolves from the strata, and with a margin of safety large enough to meet any sudden outburst of gas that may occur. And I am happy to be able to testify that nearly all the fiery collieries in this district are well up to this standard, but it should be the care of all concerned to keep them so, and never allow them to fall below it.

**TABLE No. 1.**—*A list of Accidents resulting in Death, in the Eastern District of the County, Pa., with remarks on the cause of each accident, as shown by the*

| DATE. | No. of accident. | Names of Persons Killed. | Age. | Widows. | Orphans. | Names of the Collieries. | Location of the Collieries. |
|---|---|---|---|---|---|---|---|
| Jan. 9 | 1 | Peter P. Daley, . . | 49 | 1 | 3 | No. 4 shaft, . . . . . | Jenkins township, . . . . |
| 13 | 2 | Orlando James, . | 20 | . . . | . . . | Green Ridge slope, . | Dunmore borough, . . . |
| 31 | 3 | Thomas Clarke, . . | 58 | 1 | 6 | Pierce Colliery, . . . | Archbald borough, . . . . |
| Feb. 3 | 4 | Charles Fletcher, . | 58 | 1 | 6 | Capouse shaft, . . . | Hyde Park, Scranton city |
| 4 | 5 | Alex. McDonald, . | 50 | 1 | 6 | Roaring Brook shaft, | Dunmore borough, . . . |
| 20 | 6 | Patrick Gahan, . | 19 | . . . | . . . | Phœnix shaft, . . . . | Pittston township, . . . . |
| Mar. 5 | 7 | Joseph Cox, . . . . | 48 | 1 | 3 | Hillside colliery, . . | Pleasant Valley borough, |
| 5 | 8 | Richard Hughes, . | 43 | 1 | 7 | Taylor shaft, . . . . | Taylorville, Lack'na twp. |
| 7 | 9 | Joseph Eagan, . . | 19 | . . . | . . . | Seneca slope, . . . | Pittston borough, . . . . |
| 8 | 10 | James J. Harris, . | 38 | 1 | 3 | No. 2 Diamond shaft, | Hyde Park, Scranton city |
| 15 | 11 | Walter Smiles, . . | 58 | 1 | 8 | No. 10 shaft, | Hughestown borough, |
| 28 | 12 | Samuel Monk, . . | 48 | 1 | 6 | Everhart colliery, . | Jenkins township, . . . . |
| Apr. 4 | 13 | Martin Casey, . . . | 30 | 1 | . . . | Capouse shaft, . . . | Hyde Park, Scranton city |
| 4 | 14 | John Stanton, . . . | 37 | 1 | 3 | Greenwood colliery, | Lackawanna township, . |
| 4 | 15 | John O'Brian, . . . | 16 | . . . | . . | Filer colliery, . . . . | Winton borough, . . . . |
| 8 | 16 | James Foy, . . . . | 24 | . . . | . . . | Van Storch slope, | Providence, Scranton city |
| 28 | 17 | Thomas McKune, . | 21 | . . . | . . . | Stark shaft, . . . . . | Pleasant Valley borough, |
| 29 | 18 | John Barrett, . . | 33 | 1 | 3 | No. 2 slope, (P. G.,) | Jenkins township, |
| May 1 | 19 | John Parry James, | 20 | . . . | . . . | No. 2 Diamond slope, | Hyde Park, Scranton city |
| 8 | 20 | Frank Shuster, . . | 33 | 1 | 3 | White Oak colliery, | Archbald borough, . . |
| 10 | 21 | Paul Ward, . . . . | 40 | 1 | 4 | Stark shaft, . . . . | Pleasant Valley borough, |
| 16 | 22 | Clarence Robertson | 38 | 1 | 4 | No. 12 shaft, . . . . . | Pleasant Valley borough, |
| June 2 | 23 | Patrick Roach, . . | 50 | 1 | 3 | No. 2 Diamond slope, | Hyde Park, Scranton city |
| July 2 | 24 | John Humphries, . | 65 | 1 | 1 | National colliery, . | Scranton city, . . . . . |
| 9 | 25 | Edward Joyce, . . | 60 | 1 | . . | Sibley shaft, . . . . . | Old Forge township, . . . |
| 12 | 26 | Stephen Barton, . | 35 | 1 | 4 | Stark shaft, . . . . | Pleasant Valley borough, |
| 18 | 27 | John Kearney, . . | 13 | . . . | . . . | Sloan shaft, . . . . . | Lackawanna township, . |
| 18 | 28 | Geo. W. Beddoe, . | 35 | . . . | . . . | No. 2 Diamond shaft, | Hyde Park, Scranton city |
| 31 | 29 | Rees Griffiths, . . | 16 | . . . | . . . | Sloan shaft, . . . . | Lackawanna township, . |
| Aug. 6 | 30 | Robert J. Moses, . | 17 | . . . | . . . | Bellevue shaft, . . | Lackawanna township, . |
| 11 | 31 | John Coleman, . . | 50 | 1 | 6 | No. 10 shaft, . . . . . | Hughestown borough, . |
| 13 | 32 | Owen Flynn, . . . | 16 | . . . | . . . | Roaring Brook shaft, | Dunmore borough, . . . |
| 14 | 33 | John McDermott, | 36 | 1 | 4 | No. 5 shaft, . . . . | Jenkins township, . . . . |
| 27 | 34 | Thomas Williams, | 21 | . . . | . . . | Barnum's shaft, . | Pittston township, . . . |

*Wyoming Coal Field, lying east of and including Jenkins Township, Luzerne investigation of the Inspector, for the year ending December 31, 1879.*

| Remarks on the Causes of the Accidents. | CAUSES OF THE ACCIDENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Explosions of Cl H gas. | Falling of roof and coal. | Falling down shafts. | Crushed by mine cars. | Explosions of powder and blasts. | Miscellaneous — underground | On surface. | Total | No. of accident. |
| Fatally burned by an explosion of carbureted hydrogen gas, ignited by himself. He had gone to look for it, and expected to find it, and yet walked into it with a naked light. Died the same day. Daniel Loftus was seriously injured by the concussion, but has recovered, | 1 | | | | | | | 1 | 1 |
| Killed by being crushed between a mine car and a prop, on an inside slope, | | | | 1 | | | | 1 | 2 |
| Killed instantly by a fall of roof, through the neglect of the miners, Peter Trench and C. Whitney, | | 1 | | | | | | 1 | 3 |
| Killed instantly by a fall of roof, "immediately after firing a blast," | | 1 | | | | | | 1 | 4 |
| Fatally burned by an explosion of a keg of powder. Died the following night, | | | | | 1 | | | 1 | 5 |
| Killed by a fall of roof, through the gross neglect of the miners, Austin Flemming and Patrick Tracy, | | 1 | | | | | | 1 | 6 |
| Killed instantly by falling a distance of seventy feet, into an air-shaft, which was being sunk, | | | 1 | | | | | 1 | 7 |
| Killed by a fall of top coal, he being alone to blame for the accident, | | 1 | | | | | | 1 | 8 |
| Fatally injured by being crushed between mine cars. Died of his injuries, March 21, | | | | 1 | | | | 1 | 9 |
| Killed by a fall of roof, "immediately after firing a blast," | | 1 | | | | | | 1 | 10 |
| Killed by a fall of top coal. Died on reaching the top of the shaft, | | 1 | | | | | | 1 | 11 |
| Fatally injured by a fall of roof. This accident was not considered "serious" at the time, but he died April 14, | | 1 | | | | | | 1 | 12 |
| Killed instantly by a fall of roof, "immediately after firing a blast," | | 1 | | | | | | 1 | 13 |
| Killed instantly by a fall of roof, through the neglect of the miner, Festy Daven, | | 1 | | | | | | 1 | 14 |
| Fatally injured by being crushed by mine cars at the foot of the slope. Died the following day, | | | | 1 | | | | 1 | 15 |
| Fatally injured by an explosion of cartridge powder, which he was carrying into the mines in a canvas bag. Died on the 21st, | | | | | 1 | | | 1 | 16 |
| Killed by being crushed by mine cars on an inside slope. He fell under the loaded cars, upon which he was riding up the slope, in violation of law, with the fatal result stated, | | | | 1 | | | | 1 | 17 |
| Killed instantly by a fall of roof, called "black rock," | | 1 | | | | | | 1 | 18 |
| Fatally injured by a fall of top coal. Died the same day from his injuries, | | 1 | | | | | | 1 | 19 |
| Killed instantly by a fall of coal, | | 1 | | | | | | 1 | 20 |
| Killed instantly by a fall of roof, all through his own neglect, with that of his partner, | | 1 | | | | | | 1 | 21 |
| Killed instantly by falling down the shaft from the carriage, as he was being hoisted out of the mine, | | | 1 | | | | | 1 | 22 |
| Killed by a premature blast, which exploded as John Dewire, the miner, was ramming a cartridge into a hole with the butt end of a drill. Dewire was also severely injured, | | | | | 1 | | | 1 | 23 |
| Killed by being crushed between a mine locomotive and truck, outside, between the breaker and the mine, | | | | | | | 1 | 1 | 24 |
| Killed instantly by a fall of roof, "immediately after firing a blast," | | 1 | | | | | | 1 | 25 |
| Killed by fall of roof, under which he was barring coal, "immediately after firing a blast," | | 1 | | | | | | 1 | 26 |
| Killed by falling down the shaft, a distance of three hundred and ninety-three feet, | | | 1 | | | | | 1 | 27 |
| Fatally injured by a fall of roof, "immediately after firing a blast." Died on the 20th, | | 1 | | | | | | 1 | 28 |
| Killed instantly by being crushed by mine cars, | | | | 1 | | | | 1 | 29 |
| Burned severely by an explosion of carbureted hydrogen gas. Died Sept. 20, | 1 | | | | | | | 1 | 30 |
| Killed by a fall of roof, through want of proper care on the part of the miner, Evan B. Williams, | | 1 | | | | | | 1 | 31 |
| Killed by being crushed by a trip of loaded mine cars on a run, which collided with his trip, | | | | 1 | | | | 1 | 32 |
| Killed instantly by a fall of "black rock," immediately after firing a blast," | | 1 | | | | | | 1 | 33 |
| Killed instantly by a plank falling from the top of the shaft, a distance of eighty feet, fracturing his skull, | | | | | | 1 | | 1 | 34 |

TABLE No. 1.—

| DATE. | No. of accident. | Names of Persons Killed. | Age. | Widows. | Orphans. | Names of the Collieries. | Location of the Collieries. |
|---|---|---|---|---|---|---|---|
| Aug. 28 | 35 | William Burns, . | 50 | 1 | 6 | Green Ridge slope, . | Dunmore borough, . . . |
| 29 | 36 | Thomas D. Morgan, | 26 | . . . | . . . | Mt. Pleasant slope, . | Hyde Park, Scranton city |
| Sept. 4 | 37 | Patrick Docherty, | 45 | 1 | 3 | Grassy Island shaft, | Olyphant borough, . . . . |
| 15 | 38 | Patrick Kelley, . . | 53 | 1 | 6 | No. 10 shaft, . . . . | Hughestown borough, . . |
| 15 | 39 | Mich'l McDermott, | 40 | 1 | 4 | No. 1 Jermyn's shaft | Jermyn borough, . . . . |
| 24 | 40 | John Riley, . . . | 25 | | . . . | No. 2 slope, (P. G.,) | Jenkins township, . . . . |
| 25 | 41 | William Mangan, | 50 | 1 | 5 | Meadow Brook shaft, | Scranton city, . . . . . |
| 25 | 42 | Peter Schmaltz, . . | 14 | . . . | . . . | No. 8 shaft, . . . . . | Hughestown borough, . |
| Oct. 2 | 43 | James Moran, . . | 12 | . . . | . . . | Leggett Creek shaft, | Providence, Scranton city |
| 3 | 44 | Patrick Malia, . . | 16 | . . . | . . | Leggett Creek shaft, | Providence, Scranton city |
| 4 | 45 | George Wallace, . | 18 | . . | . . . | Powder Mill shaft, . | Moosic, Lackawanna twp. |
| 20 | 46 | Wm. B. Williams, | 34 | 1 | 5 | Continental shaft, . | Lackawanna township, . |
| 23 | 47 | Peter Wall, . . . . | 65 | . . . | . . | No. 9 shaft, . . . . . | Hughestown borough, . . |
| 29 | 48 | John Parry, . . . | 40 | . | 2 | Bellevue slope, . . . | Lackawanna township, . |
| 29 | 49 | Phillip Killian, . . | 15 | . . . | . . | Seneca slope, . . . . | Pittston borough, . . . . |
| Nov. 1 | 50 | Evan R. Jones, . . | 10 | . . | . . . | Capouse shaft, . . . | Hyde Park, Scranton city |
| 3 | 51 | Patrick Carroll, . . | 18 | . . . | . . | Sibley shaft, . . . . | Old Forge township, . . . |
| 12 | 52 | Patrick Kettrick, . | 34 | 1 | 3 | Marvine shaft, . | Providence, Scranton city |
| 25 | 53 | Jno. D. Humphreys | 17 | . . . | . . . | Grassy Island shaft, | Olyphant borough, |
| Dec. 1 | 54 | David Owens, . . . | 40 | 1 | . . . | Brisbin shaft, . . . | Providence, Scranton city |
| 9 | 55 | Walter Price, . . . | 45 | 1 | 6 | Taylor shaft, . . . . | Lackawanna township, . |
| 13 | 56 | Adam Roth, . . . . | 19 | . . . | . . | Continental shaft, . | Lackawanna township, . |
| 15 | 57 | Mark Toolin, . . | 15 | . . | . . | No. 3 shaft, . . . . | Carbondale City, . . . . . |
| 20 | 58 | David Laird, . . . | 28 | 1 | 2 | No. 4 shaft, . . . . . | Jenkins township, . . . . |
| 27 | 59 | Michael Indorf, . . | 52 | . . . | . . . | Taylor shaft, . . . . | Lackawanna township, . |
| Whole number widows and orphans, | | | | 31 | 125 | Whole number of persons killed, through | |

*Continued.*

| Remarks on the Causes of the Accidents. | CAUSES OF THE ACCIDENTS. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Explosion of CH4 gas. | Falling of roof and coal. | Falling down shafts. | Crushed by mine cars. | Explosions of powder and blasts. | Miscellaneous — underground. | On surface. | Totals. | No. of accident. |
| Killed instantly by a fall of roof, while on his way to a blacksmith shop, located in the old workings, | .. | 1 | .. | .. | .. | .. | .. | 1 | 35 |
| Killed instantly by a fall of roof, "immediately after firing a blast," | .. | 1 | . | .. | .. | .. | .. | 1 | 36 |
| Fatally injured by a fall of top coal, "immediately after firing a blast." Died on the 7th, | .. | 1 | .. | .. | .. | .. | .. | 1 | 37 |
| Killed by fall of top coal, through the neglect of John Rutledge, the miner, | .. | 1 | .. | .. | .. | .. | .. | 1 | 38 |
| Killed instantly by a fall of top coal, through the combined neglect of himself and A. Flanigan, his partner, | .. | 1 | .. | .. | .. | .. | .. | 1 | 39 |
| Fatally injured by a fall of "black rock." Died October 2, | . | 1 | .. | .. | .. | .. | .. | 1 | 40 |
| Killed by an explosion of powder, which ignited from a spark from his lamp, which was hanging in his hat, while he was standing over the keg of powder, making a cartridge, | .. | .. | .. | .. | 1 | .. | .. | 1 | 41 |
| Killed instantly—skull fractured—by being crushed between a mine car and pillar, | .. | .. | .. | 1 | .. | . | .. | 1 | 42 |
| Killed by being crushed by a culm car, at the foot of a culm plane, outside, near the breaker, | .. | .. | . | .. | .. | .. | 1 | 1 | 43 |
| Killed by being crushed by a loaded car in the mine, under which he fell, having lost his light, | .. | .. | .. | 1 | .. | .. | .. | 1 | 44 |
| Killed instantly by a fall of roof in a chamber, when on his way to haul out a loaded car, | .. | 1 | .. | .. | .. | .. | .. | 1 | 45 |
| Killed by a fall of top coal and roof, in which he had just fired a blast, | .. | 1 | .. | .. | .. | .. | .. | 1 | 46 |
| Leg fractured by being crushed by a mine car at the foot of the shaft. Being so aged, he died on the 26th, | .. | .. | .. | 1 | .. | .. | .. | 1 | 47 |
| Killed instantly by a fall of roof, from under which he was cutting away a temporary prop, | .. | 1 | . | .. | .. | .. | .. | 1 | 48 |
| Killed by being knocked under the wheels of a box car, under the chutes at the breaker, | .. | .. | .. | .. | .. | .. | 1 | 1 | 49 |
| Fatally injured by falling a distance of thirty feet, into a culm and slate pocket in the breaker. Died the following night, | .. | .. | .. | .. | .. | .. | 1 | 1 | 50 |
| Fatally burned by an explosion of powder, while making a cartridge with his lamp in his hat. Died on the 5th, | .. | .. | .. | .. | 1 | . | .. | 1 | 51 |
| Killed by a fall of roof, immediately after firing a blast, | .. | 1 | .. | .. | .. | .. | .. | 1 | 52 |
| Killed by being kicked in the stomach by a mule, | .. | .. | .. | .. | .. | 1 | .. | 1 | 53 |
| Fatally injured by a fall of bony coal. Died on the 3d, | .. | 1 | .. | .. | .. | .. | . | 1 | 54 |
| Fatally burned by an explosion of carbureted hydrogen gas. Died on the 13th, | 1 | .. | .. | .. | .. | .. | .. | 1 | 55 |
| Fatally burned and poisoned by absorption of carbolic acid. Died within hour, | .. | .. | .. | .. | .. | .. | 1 | 1 | 56 |
| Killed almost instantly by being crushed under mine cars, | .. | .. | .. | 1 | .. | .. | .. | 1 | 57 |
| Killed almost instantly by a fall of roof, through his own carelessness, | .. | 1 | .. | .. | .. | .. | .. | 1 | 58 |
| Killed by falling from a wall, striking his temple against a bolt in car door, fracturing his skull, | .. | .. | .. | .. | .. | .. | 1 | 1 | 59 |
| several causes named, during the year, | 3 | 30 | 3 | 10 | 5 | 2 | 6 | 59 | |

**TABLE No. 2.**—*A list of serious, but non-fatal accidents in the Eastern District of county, Pa., with remarks on the cause of each accident as shown by the*

| DATE. | No. of Accident. | Names of Persons Injured. | Age. | Wife. | Children. | Names of the Collieries. | Location of the Collieries. |
|---|---|---|---|---|---|---|---|
| Jan. 4 | 1 | James Jordan, | 36 | 1 | 2 | Capouse shaft, | Hyde Park, Scranton city, |
| 4 | 2 | Thomas Hickey, | 37 | 1 | 4 | Erie shaft, | Carbondale township, |
| 6 | 3 | Michael Mahaday, | 46 | 1 | 4 | White Oak colliery, | Archbald borough, |
| 9 | 4 | Daniel Loftus, | 34 | | | No. 4 shaft, | Jenkins township, |
| 9 | 5 | Andrew Negley, | 17 | | | Taylor shaft, | Lackawanna township, |
| 14 | 6 | James Nute, | 35 | 1 | 3 | Filer colliery, | Winton borough, |
| 14 | 7 | Wm. Leitchnahawn | 48 | 1 | 3 | Elk Hill colliery, | Dickson City borough, |
| 16 | 8 | Patrick Nolan, | 15 | | | No. 12 shaft, | Pleasant Valley borough, |
| 21 | 9 | James Davies, | 70 | | | Central shaft, | Hyde Park, Scranton city, |
| 22 | 10 | George Shaffer, | 17 | | | Seneca slope, | Pittston borough, |
| 22 | 11 | John Lalley, | 43 | 1 | 6 | No. 6 shaft, | Jenkins township, |
| 25 | 12 | Patrick Collins, | 15 | | | Leggett's Creek shaft | Providence, Scranton city |
| 28 | 13 | Wm. Conyngham, | 16 | | | Von Storch slope, | Providence, Scranton city |
| 29 | 14 | Thomas McGuire, | 55 | 1 | 2 | Tripp's slope, | Hyde Park, Scranton city, |
| 31 | 15 | Thomas Malone, | 42 | 1 | 2 | Pierce colliery, | Archbald borough, |
| Feb. 3 | 16 | William Griffiths, | 15 | | | School Fund slope, | Hyde Park, Scranton city, |
| 8 | 17 | John Ryder, | | | | Hillside colliery, | Pleasant Valley borough, |
| 12 | 18 | Thos. Richardson, | 16 | | | No. 9 shaft, | Hughestown borough, |
| 18 | 19 | John Keeley, | 35 | 1 | 3 | No. 5 shaft, | Jenkins township, |
| 26 | 20 | Michael McGarrah, | 38 | | | Coal Brook colliery, | Carbondale City, |
| March 4 | 21 | Thomas Gleason, | 20 | | | Brisbin shaft, | Providence, Scranton city |
| 6 | 22 | Jos. Humphreys, | 14 | | | Cayuga shaft, | Providence, Scranton city |
| 11 | 23 | Thomas Walsh, | 12 | | | Roaring Brook shaft, | Dunmore borough, |
| 13 | 24 | George Davies, | 24 | | | Marvine shaft, | Providence, Scranton city |
| 14 | 25 | Michael McDonald, | 46 | | 3 | Stark shaft, | Pleasant Valley borough, |
| 21 | 26 | John Tourie, | 16 | | | Von Storch slope, | Providence, Scranton city |
| 25 | 27 | Mich'l McAndrews | 45 | | | Central shaft, | Hyde Park, Scranton city, |
| 26 | 28 | Thomas Powell, | 17 | | | Taylor shaft, | Lackawanna township, |
| 28 | 29 | James Caughan, | 38 | 1 | 4 | No. 6 slope, | Hughestown borough, |
| 31 | 30 | Michael Narry, | 36 | 1 | 3 | Von Storch slope, | Providence, Scranton city |
| April 1 | 31 | Thomas Burke, | 60 | 1 | 5 | No. 6 shaft, | Jenkins township, |
| 5 | 32 | Patrick Carden, | 40 | | | No. 10 shaft, | Hughestown borough, |
| 8 | 33 | Robert Jehu, | 16 | | | Von Storch slope, | Providence, Scranton city |
| 9 | 34 | Benj. Matthews, | 33 | | | Von Storch slope, | Providence, Scranton city |
| 9 | 35 | Patrick Harvey, | 46 | 1 | 1 | Von Storch slope, | Providence, Scranton city |
| 18 | 36 | John Hopkins, | 63 | 1 | | Bellevue shaft, | Lackawanna township, |
| 21 | 37 | Martin Gallagher, | 38 | | | Marvine shaft, | Providence, Scranton city |
| 25 | 38 | James L. Harris, | 43 | 1 | 7 | Bellevue slope, | Lackawanna township, |
| 26 | 39 | Jacob Jones, | 32 | 1 | 4 | Bellevue slope, | Lackawanna township, |
| 28 | 40 | John Toolin, | 15 | | | Coal Brook colliery, | Carbondale City, |
| May 5 | 41 | Thomas Fachey, | 55 | 1 | 5 | Central shaft, | Hyde Park, Scranton city, |
| 5 | 42 | Jonah Lloyd, | 32 | 1 | 3 | Bellevue shaft, | Lackawanna township, |
| 5 | 43 | Richard Griffiths, | 14 | | | Pierce colliery, | Archbald borough, |
| 10 | 44 | Richard Gilligan, | 17 | | | Roaring Brook shaft, | Dunmore borough, |
| 12 | 45 | George Saunders, | 20 | | | Bellevue shaft, | Lackawanna township, |
| 14 | 46 | Reese Pritchard, | 17 | | | Diamond shaft, | Hyde Park, Scranton city, |
| 14 | 47 | M. R. Williams, | 14 | | | Eddy Creek shaft, | Olyphant borough, |
| 15 | 48 | Thomas Davies, | 17 | | | Brisbin shaft, | Providence, Scranton city |
| 15 | 49 | Patrick McCrone, | 17 | | | Von Storch slope, | Providence, Scranton city |

*the Wyoming Coal Field, lying east of and including Jenkins township, Luzerne investigations of the Inspector, for the year ending December 31, 1879.*

| Remarks on Extent of Injury and Cause of Accidents. | Explosions of CH4 gas. | Falling of roof and coal. | Falling down shafts. | Crushed by mine cars. | Explosion of powder and blasts. | Miscellaneous. | On surface. | Totals. | No. of accident. |
|---|---|---|---|---|---|---|---|---|---|
| Eye knocked out by a piece of coal flying from a blast, | | | | | 1 | | | 1 | 1 |
| Arm fractured by falling from a platform at the breaker, | | | | | | | 1 | 1 | 2 |
| Head and shoulder seriously injured by a fall of top coal, | | 1 | | | | | | 1 | 3 |
| Two ribs fractured by being thrown by concussion of an explosion of carbureted hydrogen gas, | 1 | | | | | | | 1 | 4 |
| Leg fractured above the knee by falling from a mine car, | | | | 1 | | | | 1 | 5 |
| Leg and two ribs fractured by a fall of roof immediately after firing a blast, | | 1 | | | | | | 1 | 6 |
| Leg fractured between the knee and ankle by a fall of coal, | | 1 | | | | | | 1 | 7 |
| Arm dislocated by being crushed between a car and a prop, | | | | 1 | | | | 1 | 8 |
| Head and leg severely cut and bruised by a fall of roof, | | 1 | | | | | | 1 | 9 |
| Serious flesh wound in the leg by falling under a culm car on the culm dump, | | | | | | | 1 | 1 | 10 |
| Thigh fractured by being crushed by a mine car, | | | | 1 | | | | 1 | 11 |
| Thigh disjointed by falling under a mine car, | | | | 1 | | | | 1 | 12 |
| Arm fractured by lump of ice falling down the shaft, striking him, | | | | | | 1 | | 1 | 13 |
| Hip disjointed and three ribs fractured by a fall of roof, | | 1 | | | | | | 1 | 14 |
| Both arms fractured by fall of roof through neglect of the miners, | | 1 | | | | | | 1 | 15 |
| Foot crushed and head cut by a runaway car on the slope; part of the foot amputated, | | | | 1 | | | | 1 | 16 |
| Side seriously injured by coal from a blast in a cross-cut through a pillar, | | | | | 1 | | | 1 | 17 |
| Leg fractured above the ankle by a mule falling on him as he was riding it to the barn, | | | | | | | 1 | 1 | 18 |
| Face, arms, and hands severely burned by an explosion of a keg of powder, | | | | | 1 | | | 1 | 19 |
| Leg fractured below the knee, and arm slightly cut, by a fall of roof; leg amputated, | | 1 | | | | | | 1 | 20 |
| Leg fractured near the thigh, and face cut, by a fall of roof, | | 1 | | | | | | 1 | 21 |
| Shoulder dislocated by being crushed between a car and door post, | | | | 1 | | | | 1 | 22 |
| Flesh on knee fearfully torn by being caught in a screen in breaker | | | | | | | 1 | 1 | 23 |
| Head and face seriously injured by an explosion of a blast to which he returned too soon, | | | | | 1 | | | 1 | 24 |
| Thigh fractured by a fall of rock from between two tiers of coal, | | 1 | | | | | | 1 | 25 |
| Arm fractured, head severely cut, and body bruised, by being crushed by mine cars, | | | | 1 | | | | 1 | 26 |
| Leg fractured by a fall of roof through his own carelessness, | | 1 | | | | | | 1 | 27 |
| Face and hands badly burned by an explosion of powder thrown on a fire by another boy, | | | | | 1 | | | 1 | 28 |
| Back and face severely injured by a fall of top coal, | | 1 | | | | | | 1 | 29 |
| Leg fractured and back sprained by a fall of roof, | | 1 | | | | | | 1 | 30 |
| Leg fractured below knee by a piece of coal falling from pillar, | | 1 | | | | | | 1 | 31 |
| Leg fractured above the knee by a fall of top coal, | | 1 | | | | | | 1 | 32 |
| Foot badly crushed by falling in front of car, which ran over him, | | | | 1 | | | | 1 | 33 |
| Head severely cut and body injured by being run over by empty cars on an inside plane, | | | | 1 | | | | 1 | 34 |
| Face, hands, arms, and one side, badly burned by an explosion of powder while making a cartridge, | | | | | 1 | | | 1 | 35 |
| Back and side injured by being caught between the carriage and a brace, in the shaft, | | | | | | 1 | | 1 | 36 |
| Shoulder dislocated by a prop falling upon him, | | | | | | 1 | | 1 | 37 |
| Head and face fearfully injured by an explosion of premature blast, | | | | | 1 | | | 1 | 38 |
| Leg fractured above the knee by coal from a blast to which he returned too soon, | | | | | 1 | | | 1 | 39 |
| Head seriously injured by being crushed between cars while trying to couple them while in motion, | | | | 1 | | | | 1 | 40 |
| Leg fractured by a fall of roof, | | 1 | | | | | | 1 | 41 |
| Face, head, and hands burned by an explosion of carbureted hydrogen gas, | 1 | | | | | | | 1 | 42 |
| Hip dislocated by being crushed between a car and a prop, | | | | 1 | | | | 1 | 43 |
| Leg fractured by being crushed between two mine cars, | | | | 1 | | | | 1 | 44 |
| Face, arms, and hands, severely burned by an explosion of carbureted hydrogen gas, | 1 | | | | | | | 1 | 45 |
| Leg fractured by a car running upon him, his mule turning so he could not escape, | | | | | | | 1 | 1 | 46 |
| Arm fractured below the elbow by being crushed between a car and a prop, | | | | 1 | | | | 1 | 47 |
| Chest and body seriously injured by being crushed between a car and a pillar, | | | | 1 | | | | 1 | 48 |
| Arm fractured by being crushed between mine cars, | | | | 1 | | | | 1 | 49 |

TABLE No. 2—

| DATE. | No. of Accident. | Names of Persons Injured. | Age. | Wife. | Children. | Names of the Collieries. | Location of the Collieries. |
|---|---|---|---|---|---|---|---|
| May 20 | 50 | Matthew Geraghty, | 38 | 1 | 4 | Taylor shaft, | Lackawanna township, |
| 23 | 51 | Philip Philips, | 42 | 1 | 3 | Green Ridge shaft, | Scranton city, |
| 29 | 52 | John Ford, | 17 | | | No. 5 shaft, | Jenkins township, |
| 31 | 53 | Neal McCrew, | 45 | 1 | 5 | Leggett's Creek shaft | Providence, Scranton city |
| June 2 | 54 | John Weir, | 45 | 1 | 4 | No. 2 Diamond slope | Hyde Park, Scranton city, |
| 2 | 55 | John Gallagher, | 45 | 1 | 6 | Seneca slope, | Pittston borough, |
| 7 | 56 | Michael Boland, | 50 | 1 | | White Oak colliery, | Archbald borough, |
| 10 | 57 | Michael Joyce, | 40 | 1 | 8 | Erie shaft, | Carbondale township, |
| 13 | 58 | Daniel Harris, | 35 | 1 | 2 | Pyne shaft, | Old Forge township, |
| 14 | 59 | Edward Brady, | 14 | | | No. 4 shaft, | Jenkins township, |
| 14 | 60 | Mark W. Caghlin, | 14 | | | Meadow Brook shaft, | Scranton city, |
| 19 | 61 | Hezekiah Peters, | 18 | | | Continental shaft, | Lackawanna township, |
| 21 | 62 | Richard Eveleigh, | 37 | 1 | 4 | Elk Hill colliery, | Dickson City borough, |
| 23 | 63 | Jos. Brokenshire, | 40 | 1 | 4 | Green Ridge shaft, | Scranton city, |
| 28 | 64 | Patrick Ruddy, | 40 | 1 | 5 | Green Ridge slope, | Dunmore borough, |
| 28 | 65 | William Best, | 37 | 1 | 7 | Eddy Creek shaft, | Olyphant borough, |
| July 1 | 66 | Patrick McDonnell | 53 | | | White Oak colliery, | Archbald borough, |
| 1 | 67 | William Lally, | 16 | | | No. 5 shaft, | Jenkins township, |
| 3 | 68 | John Kemmy, | 48 | 1 | 7 | No. 10 shaft, | Hughestown borough, |
| 7 | 69 | William Davies, | 35 | 1 | 5 | Central shaft, | Hyde Park, Scranton city, |
| 8 | 70 | Michael M. Joyce, | 16 | | | Meadow Brook run., | Scranton city, |
| 10 | 71 | Noah Lewis, | 14 | | | No. 2 Diamond shaft | Hyde Park, Scranton city, |
| 15 | 72 | John Morris, | 29 | 1 | | Capouse shaft, | Hyde Park, Scranton city, |
| 17 | 73 | Edward James, | 40 | 1 | 5 | Sloan shaft, | Lackawanna township, |
| 18 | 74 | Patrick Collins, | 45 | 1 | 6 | Jermyn's No. 1 shaft, | Jermyn borough, |
| 18 | 75 | Michael Haley, | | | | Hillside colliery, | Pleasant Valley borough, |
| 22 | 76 | Alfred Constine, | 13 | | | Marvine shaft, | Providence, Scranton city |
| 24 | 77 | Thomas Gallagher, | 15 | | | Grassy Island shaft, | Olyphant borough, |
| 25 | 78 | George R. Price, | 35 | 1 | 1 | Bellevue slope, | Lackawanna township, |
| 26 | 79 | George O'Neill, | 40 | 1 | 3 | Roaring Creek shaft, | Dunmore borough, |
| 28 | 80 | Samuel Libby, | 18 | | | Continental shaft, | Lackawanna township, |
| 29 | 81 | Patrick Mulhern, | 45 | 1 | 6 | Pyne shaft, | Old Forge township, |
| Aug. 1 | 82 | Michael Corry, | 45 | 1 | 10 | No. 6 shaft, | Jenkins township, |
| 1 | 83 | William O'Neill, | 17 | | | Seneca slope, | Pittston borough, |
| 8 | 84 | Daniel Davis, | 65 | | | No. 1 shaft, | Carbondale City, |
| 9 | 85 | David James, | 40 | 1 | 6 | Grassy Island shaft, | Olyphant borough, |
| 12 | 86 | James Heffron, | 47 | 1 | 5 | Eddy Creek shaft, | Olyphant borough, |
| 18 | 87 | John Richards, | 20 | | | Pyne shaft, | Old Forge township, |
| 27 | 88 | John McAndrews, | 16 | | | Eddy Creek shaft, | Olyphant borough, |
| 27 | 89 | Abraham Williams | 30 | 1 | 2 | Barnum's shaft, | Pittston borough, |
| 29 | 90 | John Grier, | 14 | | | Erie shaft, | Carbondale township, |
| Sept. 5 | 91 | Daniel T. James, | 37 | 1 | 4 | Continental shaft, | Lackawanna township, |
| 6 | 92 | John Welsh, | 19 | | | Sloan shaft, | Lackawanna township, |
| 11 | 93 | Henry Hart, | 18 | | | Continental shaft, | Lackawanna township, |
| 15 | 94 | James Kelley, | 18 | | | Leggett's Creek shaft | Providence, Scranton city |
| 18 | 95 | David Morgans, | 44 | | | Spring Brook colliery | Lackawanna township, |

*Continued.*

| Remarks on Extent of Injury and Cause of Accidents. | Explosion of CH4 gas. | Falling of roof and coal. | Falling down shafts. | Crushed by mine cars. | Explosion of powder and blasts. | Miscellaneous. | On surface. | Totals. | Number of accidents. |
|---|---|---|---|---|---|---|---|---|---|
| Collar bone fractured by being crushed by a mine car, | | | | 1 | | | | 1 | 50 |
| Face and head severely injured by a premature explosion of a blast, | | | | | 1 | | | 1 | 51 |
| Severely injured in the abdoman by being kicked by a mule, | | | | | | | | 1 | 52 |
| Foot severely crushed by a fall of roof; leg amputated below the knee, | | 1 | | | | | | 1 | 53 |
| Breast, face, and arms cut, bruised and burned by a premature blast, which exploded as he was ramming a cartridge into the hole with the butt end of a drill. His laborer, Pat. Roach, was killed, | | | | | 1 | | | 1 | 54 |
| Hand severely smashed while attempting to couple cars outside at the breaker, | | | | | | | 1 | 1 | 55 |
| Leg fractured and ankle sprained by coal from a premature blast, | | | | | 1 | | | 1 | 56 |
| Leg and three ribs fractured by coal from a blast to which he returned before it exploded, | | | | | 1 | | | 1 | 57 |
| Head and shoulder injured, and seriously injured inwardly, apparently, by a fall of top coal, | | 1 | | | | | | 1 | 58 |
| Arm fractured by a kick from a mule, | | | | | | 1 | | 1 | 59 |
| Leg fractured and the flesh fearfully torn by being crushed by a mine car, under which he fell. He was a door tender, and away from his door against orders. Leg amputated, | | | | 1 | | | | 1 | 60 |
| Seriously injured by being kicked by a mule, | | | | | | 1 | | 1 | 61 |
| Leg fractured by a fall of top coal under which he was mining to take it down, | | 1 | | | | | | 1 | 62 |
| Back seriously injured by falling back off the carriage upon which he attempted to jump after it had started from the bottom of the shaft. An outrageously fool-hardy act, | | | | | | 1 | | 1 | 63 |
| Ankle dislocated by a fall of top coal, | | 1 | | | | | | 1 | 64 |
| Arm, face, and knee severely cut and bruised by coal from a blast to which he returned too soon, | | | | | 1 | | | 1 | 65 |
| Body, face, and hands severely burned by an explosion of powder which was ignited by a spark which fell from his pipe which he had in his mouth while making a cartridge, | | | | | 1 | | | 1 | 66 |
| Thigh fractured by falling under a mine car at the breaker, | | | | | | | 1 | 1 | 67 |
| Arm fractured and shoulder injured by fall of top coal immediately after firing a blast, | | 1 | | | | | | 1 | 68 |
| Head, arm, and hip severely injured by a fall of coal, | | 1 | | | | | | 1 | 69 |
| Leg fractured below the knee by being crushed by mine cars, | | | | 1 | | | | 1 | 70 |
| Foot badly crushed by being caught by the carriage at the bottom of the shaft, | | | | | | 1 | | 1 | 71 |
| Body severely injured by a fall of roof, | | 1 | | | | | | 1 | 72 |
| Hip seriously injured by coal flying from a premature blast, | | | | | 1 | | | 1 | 73 |
| Leg fractured by being crushed between a car and a prop, | | | | 1 | | | | 1 | 74 |
| Head and side seriously injured by returning too soon to a blast which exploded in his face, | | | | | 1 | | | 1 | 75 |
| Arm fractured below the elbow by falling down a slate chute in the breaker, | | | | | | | 1 | 1 | 76 |
| Face and head injured by a rail striking him, which was being used as a lever to lift a car on the track, | | | | | | 1 | | 1 | 77 |
| Hip dislocated by a fall of coal which he barred down upon himself, | | 1 | | | | | | 1 | 78 |
| Arm fractured at the shoulder by coal from a blast, | | | | | 1 | | | 1 | 79 |
| Leg fractured and otherwise injured by being crushed by mine cars, | | | | 1 | | | | 1 | 80 |
| Seriously injured inwardly, apparently, by a fall of top coal, | | 1 | | | | | | 1 | 81 |
| Leg fractured by a fall of roof which he barred down upon himself, | | 1 | | | | | | 1 | 82 |
| Shoulder dislocated by falling under a mine car, | | | | 1 | | | | 1 | 83 |
| Severe scalp wound and shoulder injured by cars striking him on an outside plane, | | | | | | | 1 | 1 | 84 |
| Leg fractured below the knee by a fall of roof, | | 1 | | | | | | 1 | 85 |
| Toes cut off by a piece of roof falling on his foot while he was standing a prop, | | 1 | | | | | | 1 | 86 |
| Leg fractured below the knee by coal sliding on him, | | | | | | 1 | | 1 | 87 |
| Arm fractured by being crushed between a mine car and door post, | | | | 1 | | | | 1 | 88 |
| Collar bone fractured and head cut by a plank falling from top of the shaft, | | | | | | 1 | | 1 | 89 |
| Arm fractured by culm car jumping the track, throwing him down off trestling, | | | | | | | 1 | 1 | 90 |
| Seriously injured by being thrown against a pillar by a lever used in putting car on track, | | | | | | | 1 | 1 | 91 |
| Head and body badly cut and bruised by a blast fired in an entrance by T. Jenkins, without warning, | | | | | 1 | | | 1 | 92 |
| Heel crushed between bumpers of mine cars, | | | | 1 | | | | 1 | 93 |
| Wrist disjointed by being crushed between car and pillar, | | | | 1 | | | | 1 | 94 |
| Face, arm, and hips severely injured by coal from a blast, | | | | | 1 | | | 1 | 95 |

TABLE No. 2.—

| DATE. | Number of accident. | Names of Persons Injured. | Age. | Wife. | Children. | Names of the Collieries. | Location of the Collieries. |
|---|---|---|---|---|---|---|---|
| Sept. 20 | 96 | James Sammons, | 32 | | | Brisbin shaft, | Providence, Scranton city |
| 22 | 97 | Thomas Cating, | 30 | 1 | 3 | No. 2 slope, (P. G.,) | Jenkins township, |
| 24 | 98 | Joseph Evans, | 20 | | | Sloan shaft, | Lackawanna township, |
| 24 | 98 | John W. Evans, | 47 | 1 | 6 | Sloan shaft, | Lackawanna township, |
| 24 | 98 | George Price, | 28 | 1 | 2 | Sloan shaft, | Lackawanna township, |
| 24 | 98 | Edward James, | 41 | 1 | 5 | Sloan shaft, | Lackawanna township, |
| 25 | 99 | Arthur Clarkson, | 14 | | | Meadow Brook shaft, | Scranton City, |
| 29 | 100 | Jonah Lloyd, | 32 | 1 | 4 | Bellevue shaft, | Lackawanna township, |
| 30 | 101 | Michael Melvin, | 20 | | | No. 7 shaft, | Jenkins township, |
| Oct. 8 | 102 | William Clark, | 50 | 1 | | White Oak colliery, | Archbald borough, |
| 10 | 103 | Oliver P. Miller, | 18 | | | No. 10 shaft, | Hughestown borough, |
| 10 | 104 | Henry Burk, | 54 | 1 | 8 | Eddy Creek shaft, | Olyphant borough, |
| 14 | 105 | Philip Mulderig, | 35 | | | Greenwood colliery, | Lackawanna township, |
| 16 | 106 | Patrick Philbin, | 55 | 1 | | No. 4 shaft, | Jenkins township, |
| 22 | 107 | Martin McAndrews | 32 | 1 | 3 | No. 5 shaft, | Jenkins township, |
| 23 | 108 | Peter McAndrews, | 50 | 1 | 6 | Eddy Creek shaft, | Olyphant borough, |
| 27 | 109 | Thomas Cowan, | 14 | | | No. 10 shaft, | Hughestown borough, |
| 28 | 110 | Henry Thomas, | 46 | | | Grassy Island shaft, | Olyphant borough, |
| Nov. 8 | 111 | Patrick Kane, | 14 | | | Greenwood colliery, | Lackawanna township, |
| 14 | 112 | John McGovern, | 53 | 1 | 2 | Leggett's Creek sh't | Providence, Scranton city |
| 15 | 113 | Thomas Larkin, | 27 | | | Central shaft, | Hyde Park, Scranton city |
| 17 | 114 | John Carroll, | 23 | | | Brisbin shaft, | Providence, Scranton city |
| 17 | 115 | Edward Fadden, | 12 | | | Eddy Creek shaft, | Olyphant borough, |
| 17 | 116 | Michael Lynch, | 14 | | | Erie shaft, | Carbondale township, |
| 18 | 117 | Patrick Mulhern, | 40 | 1 | 6 | Filer colliery, | Winton borough, |
| 20 | 118 | Pat'k McDermott, | 15 | | | Sibley shaft, | Old Forge township, |
| 25 | 119 | James Butler, | 24 | | | Sibley shaft, | Old Forge township, |
| 25 | 120 | William Mangan, | 45 | 1 | 5 | No. 10 shaft, | Hughestown borough, |
| 27 | 121 | James Maddigan, | 35 | | | Tripp's slope, | Hyde Park, Scranton city |
| 29 | 122 | William Jenkins, | 51 | | | Cayuga shaft, | Providence, Scranton city |
| Dec. 2 | 123 | John Callahan, | 13 | | | Sloan shaft, | Lackawanna township, |
| 6 | 124 | Martin Roach, | 40 | 1 | 4 | Bellevue shaft, | Lackawanna township, |
| 9 | 125 | William Carter, | 17 | | | Taylor shaft, | Lackawanna township, |
| 9 | 126 | Joseph Kendler, | 32 | 1 | 3 | Twin shaft, | Pittston borough, |
| 10 | 127 | John R. Thomas, | 16 | | | Continental shaft, | Lackawanna township, |
| 12 | 128 | John Lloyd, | 17 | | | Meadow Brook tun., | Scranton city, |
| 20 | 129 | John Mitchell, | 29 | | | No. 4 shaft, | Jenkins township, |
| 24 | 130 | Richard Rule, | 50 | 1 | | Bellevue shaft, | Lackawanna township, |
| 30 | 131 | Michael O'Boyle, | 26 | 1 | | No. 4 shaft, | Jenkins township, |

*Continued.*

| Remarks on Extent of Injury and Cause of Accident. | Explosion of CH4 gas. | Falling of roof and coal. | Falling down shafts. | Crushed by mine cars. | Explosion of powder and blasts. | Miscellaneous. | On surface. | Totals. | Number of accidents. |
|---|---|---|---|---|---|---|---|---|---|
| Back, hip, hand, and eye injured severely, by fall of roof. | . . | 1 | . . | . . | . . | . . | . . | 1 | 96 |
| Arm fractured by a blast going off, ignited by gas, which he was trying to extinguish, | . . | . . | . . | . . | 1 | . . | . . | 1 | 97 |
| The three first named of these men were severely burned by an explosion of carbureted hydrogen gas, and E. James was severely bruised, being thrown about by the concussion, and Morgan James was also slightly injured. The explosion was caused by these men being set to work in the mine while the fan was stopped, to exchange it for a new one. | 1 | . . | . . | . . | . . | . . | . . | 1 | 98 |
| | 1 | . . | . . | . . | . . | . . | . . | 1 | 98 |
| | 1 | . . | . . | . . | . . | . . | . . | 1 | 98 |
| | 1 | . | . . | . . | . . | . . | . . | 1 | 98 |
| Foot fearfully crushed between the carriage and edge of platform at the bottom of the shaft, | . . | . . | . . | . . | . . | 1 | . | 1 | 99 |
| Severely burned by an explosion of powder, ignited by a spark from his lamp, | . . | . . | . . | . . | 1 | . . | . . | 1 | 100 |
| Collar-bone fractured by a prop rolling off a car on him, | . . | . . | . . | . . | . . | 1 | . . | 1 | 101 |
| Back injured and rib fractured, by a piece of rock sliding on him, | . . | . . | . . | . . | . . | 1 | . . | 1 | 102 |
| Jaw-bone fractured, by his head being crushed between cars while unhitching his mule, | . . | . . | . . | 1 | . . | . . | . . | 1 | 103 |
| Three ribs fractured, and otherwise severely injured by fall of roof, | . | 1 | . . | . . | . . | . . | . . | 1 | 104 |
| Face, arms, and hands severely burned by an explosion of powder, through his own neglect, | . . | . . | . . | . . | 1 | . . | . . | 1 | 105 |
| Leg fractured, by a fall of roof, | . . | 1 | . . | . . | . . | . . | . . | 1 | 106 |
| Spine injured and injured otherwise, by a fall of roof "immediately after firing a blast," | . . | 1 | . . | . . | . . | . . | . . | 1 | 107 |
| Jaw-bone fractured and several teeth knocked out, by a fall of roof, | . . | 1 | . . | . . | . . | . . | . . | 1 | 108 |
| Foot seriously cut and bruised, by being crushed between a car wheel and "frog," | . . | . . | . . | 1 | . . | . . | . . | 1 | 109 |
| Cheek-bone fractured, and face and hands badly cut, by coal from a blast, | . . | . . | . . | . | 1 | . . | . . | 1 | 110 |
| Arm fractured and back injured by being thrown and dragged by a mule near the breaker, | . . | . . | . . | . . | . . | . . | 1 | 1 | 111 |
| Leg fractured by a large lump of coal rolling against him, at the face of the chamber, | . . | . . | . . | . . | . . | 1 | . . | 1 | 112 |
| Thigh fractured by a fall of roof, through the neglect of Martin Carroll, the miner, | . . | 1 | . . | . . | . . | . . | . . | 1 | 113 |
| Thigh fractured, by a fall of roof, | . . | 1 | . . | . . | . . | . . | . . | 1 | 114 |
| Cheek-bone fractured and face severely cut, by being crushed between cars and chute at the breaker, | . . | . . | . . | . . | . . | . . | 1 | 1 | 115 |
| Body seriously injured, by being crushed between a car and prop, | . . | . . | . . | 1 | . . | . . | . . | 1 | 116 |
| Leg fractured, by a fall of roof, | . | 1 | . . | . . | . . | . . | . | 1 | 117 |
| Arm fractured, by being crushed by mine cars while coupling them when in motion, | . . | . . | . . | 1 | . . | . . | . . | 1 | 118 |
| Collar-bone fractured, by a piece of coal falling from the top of the shaft, and striking him, | . . | . . | . . | . . | . . | 1 | . . | 1 | 119 |
| Arm fractured, by coal from a blast to which he returned, thinking it had missed fire, | . . | . . | . . | . . | 1 | . . | . . | 1 | 120 |
| Collar-bone fractured, while attempting to jump on a moving trip of loaded mine cars, | . . | . . | . . | 1 | . . | . . | . . | 1 | 121 |
| Leg fractured below the knee, by a fall of roof, | . . | 1 | . . | . . | . . | . . | . . | 1 | 122 |
| Nearly suffocated, by being drawn through a pea coal chute at the breaker, | . . | . . | . . | . . | . . | . . | 1 | 1 | 123 |
| Body severely injured, by a mine car running over him, | . . | . . | . . | 1 | . . | . . | . . | 1 | 124 |
| Serious scalp wound, by being thrown by the concussion of an explosion of CH4 gas, | 1 | . . | . . | . . | . . | . . | . . | 1 | 125 |
| Hands and face badly burned, by an explosion of carbureted hydrogen gas, | 1 | . . | . . | . . | . . | . . | . . | 1 | 126 |
| Foot and ankle severely injured, by being caught by the carriage at the foot of the shaft, | . | . . | . . | . . | . . | 1 | . . | 1 | 127 |
| Body severely injured, by a fall of roof, | . . | 1 | . . | . . | . . | . . | . . | 1 | 128 |
| Body severely injured by a fall of roof, through which David Laird, his partner, was killed, | . . | 1 | . . | . . | . . | . | . . | 1 | 129 |
| Body injured, by being crushed between a mine car and post, at foot of the shaft, | . . | . . | . . | 1 | . . | . . | . . | 1 | 130 |
| Back seriously injured, by a fall of roof, | . . | 1 | . . | . | . . | . . | . . | 1 | 131 |
| Total number of persons seriously injured by the several causes named, during the year, | 9 | 39 | . . | 31 | 24 | 18 | 13 | 134 | |

**TABLE No. 3.**—*List of slight accidents in the Eastern District of the Wyoming Coal Field, during the year 1879.*

| DATE. | No. of accident. | Names of persons injured. | Names of the Collieries. | Location of Collieries. | Remarks on extent of Injury and Cause of Accident. |
|---|---|---|---|---|---|
| Jan. 9 | 1 | Morgan R. Williams, . . | Grassy Island shaft, . . . . | Olyphant borough, . . . . . | Face and head slightly cut, by being squeezed between mine car and pillar. |
| 10 | 2 | Patrick Connelly, . . . | Greenwood colliery, . . . . | Lackawanna township, . . | Head slightly squeezed between mine cars. |
| 14 | 3 | Jefferson Reed, . . . . . | Twin shaft, . . . . . | Pittston borough, . . . . | Ankle sprained by a fall of roof. |
| 14 | 4 | John Roberts, . . . . . | Seneca slope, . . . . . | Pittston borough, . . . . . | Head cut, and foot injured by fall of roof. |
| 15 | 5 | John Tossney, . . . . . | Green Ridge slope, . . . . . | Dunmore borough, . . . . . | Hand bruised by fall of a piece of rock. |
| 18 | 6 | John Weber, . . . . | Butler shaft, . . . . . | Pittston township, . . . | Back and side bruised by a fall of roof. |
| 22 | 7 | Albert Matthews, . . . . | Pine Brook shaft, . . . . | Scranton city, . . . . | Leg injured by being thrown by a mule. |
| 24 | 8 | Josiah D. Caryl, . . . . | Spring Brook colliery, . . | Lackawanna township, . . | Hand injured by coupling mine cars near the breaker. |
| 28 | 9 | John O'Boyle, . . . . . | Pierce colliery, . . . . . | Archbald borough, . . . . | Body slightly injured by falling under a culm car. |
| Feb. 1 | 10 | William Jenkins, . . . . | Brisbin shaft, . . . . . | Providence, Scranton city, | Head cut slightly by a fall of roof. |
| 1 | 11 | James Gallagher, . . . . | Brisbin shaft, . . . . . | Providence, Scranton city, | Hip and foot slightly injured by a fall of roof. |
| 5 | 12 | John McDonald, . . . . | Erie shaft, . . . . . | Carbondale township, . . . | Wrist cut, and hip bruised by a blast through a pillar. |
| 6 | 13 | James White, . . . . | Green Ridge slope, . . . . . | Dunmore borough, . . . . | Hands slightly burned by an explosion of CH4 gas. |
| 8 | 14 | Patrick Murray, . . . . | Roaring Brook shaft, . . . | Dunmore borough, . . . . | Back injured, and scalp wounded by falling under a mine car. |
| 20 | 15 | Ephraim Husbet, . . . . | Phœnix shaft, . . . . . | Pittston township, . . . . . | Slightly injured by a fall of roof. |
| 22 | 16 | William Phillips, . . . . | Pyne shaft, . . . . . | Old Forge township, . . . | Head cut, and chest slightly injured by a fall of top coal. |
| 26 | 17 | Patrick McCune, . . . . | Coal Brook colliery, . . . . | Carbondale City, . . | Shoulders bruised by a fall of roof. |
| Mar. 1 | 18 | David Nichols, . . . . . | Brisbin shaft, . . . . . | Providence, Scranton city, | Face slightly injured by a kick from a mule. |
| 3 | 19 | James Tierney, . . . . . | No. 2 slope, (P. G.,) . . . . | Jenkins township, . . . . | Hip and leg injured by being squeezed between a car and rib. |
| 4 | 20 | James Gallagher, . . . . | No. 7 shaft, . . . . . | Jenkins township, . . . | Neck and hands slightly burned by on explosion of CH4 gas. |
| 4 | 21 | John Cusic, . . . . . | Marvine shaft, . . . . . | Providence, Scranton city, | Arm sprained by being caught between two cars. |
| 11 | 22 | John Lawler, . . . . . | Grassy Island shaft, . . . . | Olyphant borough, . . . . | These two men were working together, and were slightly injured by a fall of roof, through their own negligence. |
| 11 | 22 | Peter Mack, . . . . . | Grassy Island shaft, . . . . | Olyphant borough, . . . | |
| 21 | 23 | Henry Moss, . . . . . | Capouse shaft, . . . . . | Hyde Park, Scranton city, | Back slightly injured by a fall of top coal. |
| 24 | 24 | John Craig, . . . . . | Pierce colliery, . . . . . | Archbald borough, . . . | Back slightly injured by coal rolling against him. |
| 26 | 25 | Michael Jordan, . . . . | Greenwood colliery, . . . . | Lackawanna township, . . | Hips and foot bruised by a fall of coal. |
| 28 | 26 | John Bone, . . . . . | No. 7 shaft, . . . . . | Jenkins township, . . . . . | Head cut by falling into a pile of loose coal. |
| April 7 | 27 | Emil Mitchel, . . . . . | Brisbin shaft, . . . . . | Providence, Scranton city, | Head cut by falling from slate chute at the breaker. |
| 10 | 28 | Michael Maloy, . . . . . | Green Ridge slope, . . . . | Dunmore borough, . . . . | Face and body slightly injured by a premature blast. |
| 14 | 29 | John Barrett, . . . . . | Gipsey Grove colliery, . . | Dunmore borough, . . | Head and back slightly injured by a fall of roof. |
| 16 | 30 | Isaac Lloyd, . . . . . | Cayuga Shaft, . . . . . | Providence, Scranton city, | Back slightly injured by a fall of roof. |
| 16 | 31 | John Cahoe, . . . . . | Seneca slope, . . . . . | Pittston borough, . . . | Three fingers injured by removing block from before car wheel. |
| 19 | 32 | David Harris, . . . . . | Brisbin shaft, . . . . . | Providence, Scranton city, | Face cut by a fall of top coal. |
| 22 | 33 | Daniel Lynch, . . . . . | Continental shaft, . . . . . | Hyde Park, Scranton city, | Chest and hip injured by falling in the chutes at the breaker. |
| 25 | 34 | Francis Mangan, . . . . | Central shaft, . . . . . | Hyde Park, Scranton city, | Body injured by being squeezed between mine cars. |
| 28 | 35 | Nimrod Himms, . . . . | Spring Brook colliery, . . . | Lackawanna township, . . | Face injured by being kicked by a mule. |

| | | | | | |
|---|---|---|---|---|---|
| Apr. 30 | 36 | William Jepson, | No. 7 shaft, | Jenkins township, | Ankle sprained by a fall of coal. |
| 30 | 37 | Michael Green, | Mt. Pleasant slope, | Hyde Park, Scranton city, | Injured slightly by a fall of bony coal. |
| May 2 | 38 | William O. Davies, | Taylor shaft, | Lackawanna township, | Slightly injured by a fall of roof. |
| 5 | 39 | Michael Connors, | No. 4 slope, | Jenkins township, | Slightly injured by a fall of rider coal, and "black rock." |
| 6 | 40 | John Welsh, | Bellevue shaft, | Lackawanna township, | Scalp wounded by a fall of roof. |
| 6 | 41 | Michael Gilroy, | No. 4 shaft, | Jenkins township, | Slightly injured by a fall of roof. |
| 13 | 42 | Job Davies, | Pine Brook shaft, | Scranton city, | Scalp wounded by falling, while attempting to escape from a bursting steam pipe. |
| 19 | 43 | Michael Murphy, | Butler shaft, | Pittston township, | Slight flesh wound on leg by coal from a blast. |
| 26 | 44 | Samuel Baker, | Green Ridge shaft, | Scranton city, | Hands slightly burned by an explosion of CH4 gas. |
| 27 | 45 | Thomas H. Harris, | Mt. Pleasant slope, | Hyde Park, Scranton city, | Back bruised by a fall of roof. |
| 27 | 46 | Isaac Stone, | Taylor shaft, | Lackawanna township, | Slightly injured by a fall of top coal. |
| 28 | 47 | Thomas R. Davies, | School Fund slope, | Hyde Park, Scranton city, | Shoulder and side bruised by a fall of top coal. |
| 31 | 48 | Patrick Moran, | No. 4 shaft, | Jenkins township, | Flesh wound in the arm by coal flying from a blast. |
| June 3 | 49 | Frederick Douse, | Central shaft, | Hyde Park, Scranton city, | Back cut by a fall of a piece of rock. |
| 9 | 50 | Luke Flynn, | White Oak colliery, | Archbald borough, | Back and arm cut by coal from a premature blast. |
| 10 | 51 | Patrick Conners, | Brisbin shaft, | Providence, Scranton city, | Face slightly injured by falling from culm car, on surface. |
| 13 | 52 | John Myers, | Sloan shaft, | Lackawanna township, | Head and hands slightly cut by a fall of coal and bony. |
| 13 | 53 | John Evans, | No. 8 shaft, | Hughestown borough, | Slightly injured by a piece of coal from a blast. |
| 14 | 54 | James J. Gannon, | Meadow Brook shaft, | Scranton city, | Flesh wound on the arm by being caught in brake rack of car. |
| 14 | 55 | Martin Burns, | Von Storch slope, | Providence, Scranton city, | Thumb injured while coupling mine cars. |
| 16 | 56 | Martin Bell, | Hillside colliery, | Pleasant Valley borough, | Nose broken by being struck by a wooden mine rail. |
| 18 | 57 | Richard Drown, | Marvine shaft, | Providence, Scranton city, | Leg slightly injured by a fall of bony coal. |
| 20 | 58 | Patrick McDonald, | Roaring Brook shaft, | Dunmore borough, | Slightly injured by being squeezed between mine cars. |
| 21 | 59 | Thomas Mahon, | Eddy Creek shaft, | Olyphant borough, | Face burned with powder while filling a straw squib. |
| 24 | 60 | Michael Melvin, | No. 2, Diamond shaft, | Hyde Park, Scranton city, | Finger mashed while uncoupling mine cars. |
| 24 | 61 | James Delaney, | No. 4 shaft, | Jenkins township, | Leg bruised by falling in front of a mine car. |
| July 1 | 62 | Michael Smitch, | No. 8 shaft, | Hughestown borough, | Head and arm cut by returning too soon to a blast. |
| 3 | 63 | Michael Ford, | No. 6 shaft, | Jenkins township, | Ankle injured by falling while running away from a blast. |
| 3 | 64 | Martin Gunny, | Central shaft, | Hyde Park, Scranton city, | Face injured by a kick from a mule. |
| 5 | 65 | William Ellis, | Taylor shaft, | Lackawanna township, | Foot sprained by being caught in a mule pump. |
| 7 | 66 | Thomas Tighe, | No. 6 shaft, | Jenkins township, | Leg injured by riding on loaded cars up an inside slope. |
| 8 | 67 | Thomas Williams, | Bellevue slope, | Lackawanna township, | Foot injured by a lump of coal rolling on it. |
| 10 | 68 | Isaac Brigger, | Taylor shaft, | Lackawanna township, | Slightly injured by a fall of roof. |
| 11 | 69 | Jacob Sunday, | School Fund slope, | Hyde Park, Scranton city, | Slightly injured by a fall of bony coal. |
| 14 | 70 | James Eagan, | Taylor shaft, | Lackawanna township, | Slightly injured by a fall of top coal. |
| 14 | 71 | Thomas Davies, | Spring Brook colliery, | Lackawanna township, | Face cut by being thrown by a mule. |
| 15 | 72 | Fred. Cottle, | Gipsey Grove, | Dunmore borough, | Head slightly injured between top railing of car and roof. |
| 16 | 73 | William Callins, | Green Ridge slope, | Dunmore borough, | Arm bruised by being caught between mine cars. |
| 23 | 74 | Michael English, | Mt. Pleasant slope, | Hyde Park, Scranton city, | Head, back, and shoulder cut by a fall of roof. |
| 23 | 74 | Jacob Grier, | Mt. Pleasant slope, | Hyde Park, Scranton city, | Head cut by same fall of roof. |
| 23 | 74 | William Hobling, | Mt. Pleasant slope, | Hyde Park, Scranton city, | Ankle bruised by same fall of roof. |
| 26 | 75 | Patrick Flannery, | Greenwood colliery, | Lackawanna township, | Leg slightly injured by being caught between mine cars. |
| Aug. 1 | 76 | Michael Reap, | Von Storch slope, | Providence, Scranton city, | Head injured by coal from a blast. |
| 5 | 77 | Henry Hagan, | Bellevue colliery, | Lackawanna township, | Face cut by a kick from a mule, while shoeing it. |
| 11 | 78 | Patrick Ludden, | Taylor shaft, | Lackawanna township, | Slightly injured by a fall of roof. |
| 11 | 79 | John Vernon, | Eaton colliery, | Archbald borough, | Flesh wound on the arm by falling under a culm car. |
| 13 | 80 | Thomas H. Williams, | National slope, | Scranton city, | Face and hands slightly burned by an explosion of gas. |
| 13 | 81 | August Henemote, | White Oak colliery, | Archbald borough, | Head and back injured by a blast through a pillar. |
| 15 | 82 | Wilford Fletcher, | Capouse shaft, | Hyde Park, Scranton city, | Face and hip injured by a blast, to which he returned too soon. |
| 15 | 83 | Edward Kenney, | White Oak colliery, | Archbald borough, | Finger mashed by car wheel while trying to block it. |
| 19 | 84 | William White, | Marvine Shaft, | Providence, Scranton city, | Flesh wound on leg by falling off a loaded car. |

TABLE No. 3—*Continued.*

| DATE. | No. of accident. | Names of Persons Injured. | Names of the Collieries. | Location of the Collieries. | Remarks on extent of Injury and Cause of Accidents. |
|---|---|---|---|---|---|
| Aug. 20 | 85 | Michael Crane, | No. 6 breaker, | Dunmore borough, | Injured by falling astride a piece of timber in the breaker. |
| 22 | 86 | Richard Davies, | No. 2 Diamond shaft, | Hyde Park, Scranton city, | Slightly injured by a fall of roof. |
| 26 | 87 | William G. Griffiths, | Sloan shaft, | Lackawanna township, | Leg slightly injured between mine cars and track. |
| 26 | 88 | John E. Williams, | Sloan shaft, | Lackawanna township, | Head and neck injured by a fall of roof. |
| 30 | 89 | Martin Neillon, | No. 1 shaft, | Hughestown borough, | Slightly injured by falling back from carriage at foot of shaft. |
| Sept. 2 | 90 | Llewellyn Jones, | Sloan shaft, | Lackawanna township, | Face cut by a piece of top coal sliding on bar while barring it. |
| 3 | 91 | John Kennedy, | Tripp's slope, | Hyde Park, Scranton city, | Toes injured by a fall of roof. |
| 8 | 92 | Jacob Lutz, | Tripp's slope, | Hyde Park, Scranton city, | Head injured by a piece of timber striking him when unloading it. |
| 8 | 93 | William Sweeny, | No. 10 shaft, | Hughestown borough, | Head injured by a fall of a piece of "black rock." |
| 10 | 94 | Charles Payne, | Von Storch slope, | Providence, Scranton city, | Hip bruised and head slightly injured by a fall of roof. |
| 11 | 95 | David Lewis, | Capouse shaft, | Hyde Park, Scranton city, | Face scalded by steam escaping while fixing joint in steam pipe. |
| 16 | 96 | Patrick Cannon, | Eddy Creek shaft, | Olyphant borough, | Head cut by a piece of coal flying from a blast. |
| 22 | 97 | David Thomas, | Taylor shaft, | Lackawanna township, | Slightly injured by being squeezed against a mine car by mule. |
| 22 | 98 | Alexander McDonald, | Erie shaft, | Carbondale township, | Hip injured by being caught between mine cars. |
| 23 | 99 | John Trantnor, | Leggett's Creek shaft, | Providence, Scranton city, | Face and hands slightly burned by "feeder" of gas. |
| 24 | 100 | Morgan James, | Sloan shaft, | Lackawanna township, | Burned slightly by an explosion of carbureted hydrogen gas. |
| 27 | 101 | Patrick Burke, | Eddy Creek shaft, | Olyphant borough, | Back bruised by a fall of roof. |
| Oct. 9 | 102 | Thomas Sheridan, | Sloan shaft, | Lackawanna township, | Head cut and body bruised by a fall of top coal. |
| 14 | 103 | Charles Myers, | Eddy Creek shaft, | Olyphant borough, | Foot injured by coal falling from the face which he was mining out. |
| 15 | 104 | Jeremiah Carter, | Greenwood colliery, | Lackawanna township, | Back slightly injured by a fall of roof. |
| 25 | 105 | Patrick Knight, | Von Storch slope, | Providence, Scranton city, | Hip bruised by being squeezed between a car and a prop. |
| 27 | 106 | James Grimes, | Spring Brook colliery, | Lackawanna township, | Foot injured by being caught between mine locomotive and tender. |
| 29 | 107 | Frank Cooper, | Taylor shaft, | Lackawanna township, | Foot injured by being caught in a car wheel. |
| 30 | 108 | David Mahan, | Sibley shaft. | Old Forge township, | Head and face cut by coal flying from a blast. [by over-winding. |
| Nov. 1 | 109 | Miss Lloyd Jones, | Capouse shaft, | Hyde Park, Scranton city, | Head slightly cut by a bolt flying from carriage through rope breaking |
| 10 | 110 | James Greeley, | Pine Brook shaft, | Scranton city, | Finger mashed between props on car and the roof. |
| 11 | 111 | Martin McDonough, | Pine Brook shaft, | Scranton city, | Hip injured by a kick from a mule. |
| 14 | 112 | Martin Hunt, | Tripp's slope, | Hyde Park, Scranton city, | Finger mashed by attempting to draw block from car wheel. |
| 15 | 113 | John Evans, | Pyne shaft, | Old Forge township, | Two fingers crushed and head cut by falling off car. |
| 15 | 114 | John J. Moran, | Pyne shaft, | Old Forge township, | Foot slightly bruised by coal falling from the face. |
| 17 | 115 | Patrick Dickson, | Marvine shaft, | Providence, Scranton city, | Face and arms cut by coal from a blast. |
| 17 | 116 | Henry Sengleman, | Butler shaft, | Pittston township, | Body bruised between mine car and door post. |
| 24 | 117 | Patrick Gilboy, | Coal Brook colliery, | Carbondale City, | Ankle sprained by falling in chamber. |
| 29 | 118 | Martin Cannon, | Eddy Creek shaft, | Olyphant borough, | Hip injured by coal flying from blast fired with a kerosene match. |
| Dec. 3 | 119 | Daniel Donby, | Marvine shaft, | Providence, Scranton city, | Hands and face slightly burned by an explosion of CH4 gas. |
| 5 | 120 | Michael Costello, | Taylor shaft, | Lackawanna township, | Head and legs slightly injured by a fall of roof. |
| 6 | 121 | John Hughes, | Brisbin shaft, | Providence, Scranton city, | Back slightly injured by a fall of piece of coal from pillar. |
| 13 | 122 | David Allgood, | Mount Pleasant slope, | Hyde Park, Scranton city, | Arm cut and bruised by falling in front of a mine car. |

| | | | | | |
|---|---|---|---|---|---|
| Dec. 17 | 123 | James Cornellus, | Dodge shaft, | Lackawanna township, | Flesh wound on the leg by falling under a mine car. |
| 20 | 124 | Patrick Scanlon, | Maryine shaft, | Providence, Scranton city, | Head and shoulder injured by a fall of coal. |
| 22 | 125 | Daniel Jenkins, | Spring Brook colliery, | Lackawanna township, | Ankle sprained by mine car jumping off the track. |
| 23 | 126 | Patrick Mahon, | Sloan shaft, | Lackawanna township, | Head and face cut by coal of a premature blast. |
| 30 | 127 | Thomas Phillips, | Cayuga shaft, | Providence, Scranton city, | Leg cut by coal flying from a blast through a pillar. |
| 30 | 127 | James Corles, | Cayuga shaft, | Providence, Scranton city, | Legs bruised by coal flying from the same blast. |
| 30 | 128 | Edward Flynn, | No. 4 shaft, | Jenkins township, | Arm injured by a fall of roof. |

**TABLE No. 4.**—*Showing the number of persons killed and injured, and causes of accidents, and number of widows and orphans, for six years, 1874—1880.*

| CAUSES OF THE ACCIDENTS. | 1874. | | 1875. | | 1876. | | 1877. | | 1878. | | 1879. | | TOTALS. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Explosion of carburated hydrogen gas, | 6 | 10 | 3 | 1 | 6 | 21 | 1 | 28 | . . . | . . . | 3 | 9 | 19 | 69 |
| Falls of roof, | 26 | 26 | 18 | 20 | 16 | 29 | 24 | 55 | 11 | 24 | 22 | 27 | 117 | 181 |
| Falls of coal, | 13 | 8 | 11 | 25 | 4 | 15 | 7 | 9 | 5 | 10 | 8 | 12 | 47 | 79 |
| Falling down shafts, | 1 | 2 | 1 | 2 | 2 | . . . | . . | . . . | 1 | . . . | 3 | . . . | 8 | 4 |
| Explosions of blasting powder, | . . . | 3 | 1 | 10 | 3 | 12 | . . . | 7 | 1 | 2 | 4 | 6 | 9 | 40 |
| Premature blasts and blasts hanging fire, &c., | 6 | 13 | 10 | 5 | . . . | . . | 1 | 7 | 1 | 3 | 1 | 18 | 19 | 46 |
| Crushed by mine cars, | 13 | 18 | 12 | 15 | 9 | 19 | 1 | 38 | 5 | 27 | 10 | 31 | 50 | 148 |
| Miscellaneous under ground, | 2 | 5 | 2 | 16 | 2 | 19 | 3 | 19 | 4 | 15 | 2 | 18 | 15 | 92 |
| Miscellaneous above ground, | 2 | 4 | 4 | 8 | 2 | 5 | 3 | 11 | 6 | 8 | 6 | 13 | 23 | 49 |
| Whole numbers, | 69 | 89 | 62 | 102 | 44 | 120 | 40 | 174 | 34 | 89 | 59 | 134 | 307 | 708 |
| Whole number of widows, | | 38 | | 36 | | 21 | | 29 | | 19 | | 31 | | 174 |
| Whole number of orphans, | | 112 | | 118 | | 79 | | 134 | | 72 | | 125 | | 640 |

**TABLE No. 5.**—*Showing the production of coal, the number of persons employed, the ratio of coal mined for each person employed, for each person killed, and for each person killed and injured, in the Eastern District, for six years ending December 31, 1879.*

| | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | Averages and Totals. |
|---|---|---|---|---|---|---|---|
| Production of coal per year, in tons, . . | 6,357,879 | 7,956,452 | 4,862,512 | 4,808,208 | 4,943,410 | 7,182,083.21 | 36,110,544.21 |
| Number of persons employed, . . . . | 16,561 | 17,808 | 17,152 | 16,312 | 15,699 | 16,099 | 16,605 |
| Ratio of coal mined per person employed | 383.9 | 446.8 | 283.5 | 294.8 | 316.8 | 446.12 | 362.44 |
| Ratio of coal mined per life lost, . . . | 92,143 | 128,340 | 110,511 | 120,205 | 145,396 | 121,730 | 117,624 |
| Ratio of coal mined per person killed and injured, . . . . . | 40,202 | 48,515 | 39,458 | 22,463 | 40,190 | 37,213 | 35,577 |
| Ratio of persons employed per life lost, | 240 | 287.22 | 389.81 | 407.80 | 461.70 | 273 | 322 57 |

**ABLE No. 6.**—*Showing the number of persons killed, and number of persons seriously and slightly injured, and number of days worked, with number of persons employed, and number of kegs of powder used, together with number of tons mined per employé, per life lost, and total tonnage for each colliery for the year 1879.*

**Delaware, Lackawanna and Western Railroad Company.**

| NAMES OF THE COLLIERIES. | Persons killed. | Persons seriously injured. | Persons slightly injured. | Days worked by breaker. | Number of persons employed. | Tons of coal mined per employee. | Tons of coal mined per life lost. | Kegs of powder used. | Tons of coal mined during 1879. |
|---|---|---|---|---|---|---|---|---|---|
| Pyne shaft, | .... | 3 | 3 | 261 | 331 | 599.91 | No death, | 4,317 | 198,570.04 |
| Taylor shaft and drift, | 3 | 4 | 9 | 266 | 383 | 459.10 | 58,612.04 | 4,018 | 175,836.12 |
| Archbald shaft. | | | | | | | | | |
| Sloan shaft, | 2 | 7 | 7 | 261 | 311 | 500 | 77,819.06 | 3,383 | 155,638.13 |
| Dodge shaft, | .... | .... | 1 | 35 | 271 | 64.30 | No death, | 379 | 17,434.11 |
| Scranton Coal Company's slope. | | | | | | | | | |
| Bellevue slope, | 1 | 3 | 1 | 246 | 128 | 474.37 | 89,718.03 | 1,950 | 89,718.03 |
| Bellevue shaft, | 1 | 6 | 2 | 246 | 311 | | 118,534.10 | 2,577 | 118,534.10 |
| Hampton shaft, | .... | .... | .... | 49¼ | 323 | 95.85 | No death, | 673 | 30,960 |
| Continental shaft, | 2 | 5 | 1 | 153 | 321 | 283.46 | 45,496 | 1,978 | 90.992 |
| Hyde Park shaft. | | | | | | | | | |
| Central shaft, | .... | 5 | 3 | 286⅛ | 337 | 587.79 | No death, | 4,306 | 198,084.01 |
| Oxford shaft. | | | | | | | | | |
| Diamond shaft, | 2 | 2 | 2 | 270¼ | 420 | 486.60 | 102.185.5 | 4,442 | 204,371 |
| Diamond No. 2 slope, | 2 | 1 | .... | 270 | 253 | 476.96 | 46,238.5 | 2,010 | 92,477 |
| Tripp's slope, | .... | 2 | 3 | 270½ | 126 | | No death, | 1,920 | 88,321 |
| Brisbin shaft, | 1 | 4 | 7 | 254⅛ | 294 | 510 | 149,978.10 | 3,260 | 149,978.10 |
| Cayuga shaft, | .... | 2 | 3 | 258⅛ | 277 | 500 | No death, | 3,013 | 138,614.04 |
| Total, Delaware, Lackawanna and Western Railroad Company, | 14 | 44 | 42 | ..... | 4,086 | 428.18 | 124,966.49 | 38,226 | 1,749,530.08 |

**Pennsylvania Coal Company.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. 1 shaft, | .... | .... | 1 | 291 | 62 | 335.11 | No death, | 693 | 20,777 |
| No. 4 shaft, | 2 | 5 | 4 | 282 | 158 | 697 | 55,069.5 | 3,671 | 110,139 |
| No. 5 shaft, | 1 | 4 | .... | 290 | 164 | 500.80 | 82,152 | 2,798 | 82,152 |
| No. 6 shaft, | .... | 3 | 2 | 290 | 165 | 400.20 | No death, | 2,201 | 66,035 |
| No. 7 shaft, | .... | 1 | 3 | 270 | 157 | 523.54 | No death, | 2,730 | 82,196 |
| No. 8 shaft, | 1 | .... | 2 | 291 | 144 | 567.85 | 81,771 | 2,723 | 81,771 |
| No. 9 shaft, | .... | 1 | .... | 286 | 134 | 476.30 | 63,824 | 2,127 | 63,824 |
| No. 9 new shaft, | 1 | .... | .... | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. 10 shaft—7 feet vein, | .... | .... | .... | 290 | 159 | 426 | No death, | 2,257 | 67,731 |
| No. 10 shaft—14 feet vein, | 3 | 5 | 1 | 290 | 88 | 617.20 | 18,304.33 | 1,810 | 54,313 |
| No. 10 new shaft, | .... | .... | .... | 290 | 106 | 358.43 | No death, | 1,266 | 37,995 |
| No. 11 shaft, | .... | .... | .... | 220 | 105 | 383.63 | No death, | 1,332 | 39,966 |
| No. 12 shaft, | 1 | 1 | .... | 288 | 145 | 560.81 | 81,318 | 2,724 | 81,318 |
| No. 13 shaft, | .... | .... | .... | 288 | 58 | 366.58 | No death, | 709 | 21,262 |
| No. 2 slope, (Port Griffith,) | 2 | 1 | 1 | 290 | 97 | 532 | 25,602 | 1,720 | 51,604 |
| No. 4 slope, | .... | .... | 1 | 293 | 145 | 594.34 | No death, | 2,873 | 86,180 |
| No. 6 slope, | .... | 1 | .... | 291 | 72 | 441.18 | No death, | 1,059 | 31,765 |
| Dawson's shaft, | .... | .... | .... | 93 | ..... | ..... | ..... | 569 | 17,086 |
| Stark's shaft, | 3 | 1 | ... | 283 | 224 | 407.74 | 30,444.33 | 3,513 | 91,333 |
| Law's shaft, | .... | .... | .... | 289 | 138 | 489 | No death, | 2,588 | 67,293 |
| No. 1 tunnel, | .... | .... | .... | 290 | 100 | 526.12 | No death, | 1,760 | 52,612 |
| No. 2 slope, (Dunmore,) | .... | .... | 1 | 263 | 95 | 494 | No death, | 1,805 | 46,932 |
| Gipsy Grove—No. 3 shaft, | .... | .... | 1 | 263 | 239 | 444.54 | No death, | 4,086 | 106,245 |
| Gipsy Grove—No. 4 shaft, | .... | .... | 1 | | | | | | |
| Barnum's shaft, | 1 | 1 | | | | | | | |
| Total, Pennsylvania Coal Company, | 15 | 24 | 18 | ..... | 2,755 | 493.84 | 90,702 | 47,014 | 1,360,529 |

**Delaware and Hudson Canal Company.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Von Storch's slope, | 1 | 7 | 4 | 264½ | 537 | 513.3 | 275,639.06 | 6,891 | 275,639.06 |
| Leggett's Creek shaft, | 2 | 4 | 1 | 180½ | 303 | 397.25 | 60,158.57 | 3,009 | 120,377.15 |
| Marvine's shaft, | 1 | 3 | 6 | 238½ | 339 | 540 | 183,233.05 | 4,588 | 183,233.05 |
| Eddy Creek shaft, | .... | 7 | 5 | 208½ | 288 | 373.42 | No death, | 3,585 | 107,544.03 |
| Grassy Island shaft, | 2 | 3 | 3 | 211½ | 360 | 408.87 | 73,597.04 | 4,906 | 147,194.17 |
| White Oak colliery, | 1 | 4 | 3 | 251½ | 337 | 427.80 | 144,170.12 | 3,604 | 144,170.12 |
| No. 1 shaft and White Bridge tunnel, | ... | 1 | .... | 284 | 305 | ..... | No death, | 416 | 12,487.16 |
| No. 3 shaft, | 1 | .... | .... | 54 | 109 | ..... | ..... | 129 | 3,887.12 |
| Coal Brook colliery—5 tunnels, | .... | 2 | 2 | 180½ | 467 | 374.28 | No death, | 5,826 | 174,790.17 |
| Rackett Brook breaker, | .... | .... | .... | 220½ | 84 | ..... | No death, | 5,893 | 176,788.10 |
| Total, Delaware and Hudson Canal Company, | 8 | 31 | 24 | ..... | 3,129 | 430.5 | 168,264.2 | 38,847 | 1,346,113.10 |

**Miscellaneous Companies.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Everhart colliery, | 1 | .... | .... | 224½ | 138 | 395.63 | 54,406.19 | 1,493 | 54,406.19 |
| Tomkins' shaft, | .... | .... | .... | 72 | 50 | 89.9 | No death, | 166 | 4,495 |
| Seneca slope, | 2 | 3 | 2 | 204½ | 218 | 270 | 29,506.5 | 2,565 | 59,013 |
| Ravine shaft, | .... | .... | .... | ..... | 4 | | | | |
| Twin shaft, | ... | 1 | 1 | 93½ | 69 | 278 | No death, | 889 | 19,178 |
| Beaver colliery, | .... | .... | .... | 124 | 22 | 236.7 | No death, | 224 | 5,207 |
| Rock Hill tunnel, | .... | .... | .... | 33 | 66 | 55.14 | No death, | 124 | 3,705.14 |
| Butler shaft, | .... | .... | 3 | 238 | 161 | 359.6 | No death, | 2,510 | 58,897 |
| Phœnix shaft, | 1 | .... | 1 | 214 | 130 | 280 | 36,472 | 1,485 | 36,472 |

TABLE No. 6.—Miscellaneous Companies—Continued.

| NAMES OF THE COLLIERIES. | Persons killed. | Persons seriously injured. | Persons slightly injured. | Days worked by breaker. | Number of persons employed. | Tons of coal mined per employee. | Tons of coal mined per life lost. | Kegs of powder used. | Tons of coal mined during 1879. |
|---|---|---|---|---|---|---|---|---|---|
| Columbia colliery, | .... | .... | ... | 77 1/8 | 45 | 191.04 | No death, | 235 | 8,636.18 |
| Hillside colliery, | 1 | 2 | 1 | 264 1/2 | 255 | 372.87 | 95,082 | 3,697 | 95,082 |
| Spring Brook colliery, | 1 | 1 | 5 | 271 1/4 | 234 | 451.16 | 105,571.08 | 3,214 | 105,571.08 |
| Greenwood colliery, | 1 | 2 | 4 | 169 | 379 | 267.5 | 101,481 | 5,378 | 101,481 |
| Sibley shaft, | 2 | 2 | 1 | 112 | 237 | 148.7 | 17,621 | 1,904 | 35,242 |
| Meadow Brook colliery, | 1 | 4 | 1 | 219 1/2 | 254 | 440.34 | 111,848 | 4,474 | 111,848 |
| National colliery, | 1 | .... | 1 | 235 1/8 | 261 | 384.74 | 100,419 | 3,863 | 100,419 |
| School Fund Association slope, | .... | 1 | 2 | 235 | 194 | 347.94 | No death, | 2,475 | 67,500 |
| Mount Pleasant slope, | 1 | .... | 6 | 275 | 276 | 471 | 130,000 | 3,714 | 130,000 |
| Capouse shaft, | 3 | 2 | 4 | 224 3/8 | 404 | 371.68 | 50,086.33 | 6,579 | 150,260 |
| Pine Brook shaft, | .... | .... | 4 | 181 | 153 | 621 | No death, | 3,613 | 95,000 |
| Fairlawn slope, | .... | .... | .... | 74 1/2 | 133 | 115.35 | No death, | 645 | 15,342 |
| Jermyn's Green Ridge shaft, | .... | 2 | 1 | 201 | 300 | 456.27 | No death, | 4,590 | 136,882 |
| Green Ridge slope, | 2 | 1 | 4 | 211 3/4 | 258 | 385.82 | 50,790 | 3,921 | 101,941.13 |
| Roaring Brook shaft, | 2 | 3 | 2 | 234 3/4 | 279 | 482 | 67,251 | 4,460 | 134,502 |
| Elk Hill colliery, | ... | 2 | .... | 167 | 118 | 311.24 | No death, | 1,393 | 36,726 |
| Filer colliery, | 1 | 2 | .... | 210 1/2 | 338 | 347 | 118,261.12 | 4,495 | 118,261.12 |
| Pierce colliery, | 1 | 2 | 2 | 203 3/4 | 269 | 398 | 107,080 | 3,738 | 107,080 |
| Eaton colliery, | .... | .... | 1 | 218 1/2 | 166 | 370 | No death, | 2,085 | 61,467.09 |
| Jermyn's slope, | .... | .... | .... | 230 1/4 | 92 | 413 | No death, | 1,427 | 38,000 |
| Jermyn's shaft, | 1 | 1 | ... | 228 3/4 | 330 | 333.33 | 110,000 | 2,854 | 110,000 |
| Erie shaft, | .... | 4 | 2 | 190 | 251 | 204.7 | No death, | 2,865 | 76,281 |
| Forest City colliery, | .... | .... | ... | 193 1/4 | 45 | 333.62 | No death, | 454 | 15,013 |
| Totals, miscellaneous companies, | 22 | 35 | 48 | ..... | 6,129 | 357.92 | 99,723.23 | 81,528 | 2,193,911.03 |

**Recapitulation.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Delaware, Lackawanna and Western Railroad Company, | 14 | 44 | 42 | ..... | 4,086 | 428.18 | 124,966.49 | 38,226 | 1,749,530.08 |
| Pennsylvania Coal Company, | 15 | 24 | 18 | ..... | 2,755 | 493.84 | 90,702 | 47,014 | 1,360,529 |
| Delaware and Hudson Canal Company, | 8 | 31 | 24 | ..... | 3,129 | 430.50 | 168,264.20 | 38,847 | 1,346,113.10 |
| Miscellaneous companies, | 22 | 35 | 48 | ..... | 6,129 | 357.92 | 99,723.23 | 81,528 | 2,193,911.03 |
| Home consumption of coal, (estimated,) | .... | .... | .... | ..... | ..... | ... | .... | ..... | 532,000 |
| Grand totals, | 59 | 134 | 132 | ..... | 16,099 | 446.12 | 121,730 | 205,615 | 7,182,083.21 |

**TABLE No. 7.**—*The number of Men and Boys employed at each Colliery, during the year 1879.*

**Delaware, Lackawanna and Western Railroad Company.**

| NAMES OF THE COLLIERIES. | NUMBER OF PERSONS EMPLOYED INSIDE. | | | | | | | NUMBER OF PERSONS EMPLOYED OUTSIDE. | | | | | | | Grand totals inside and outside. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosses. | Miners. | Laborers. | All company men. | Drivers and runners. | Door boys. | Totals inside. | Bosses. | Mechanics. | Head & plate men. | All company men. | Drivers and runners. | Slate pickers. | Total outside. | |
| Pyne Shaft, | 1 | 76 | 76 | 12 | 32 | 6 | 203 | 1 | 8 | 10 | 29 | 5 | 75 | 128 | 331 |
| Taylor shaft and drift, | 1 | 82 | 82 | 29 | 38 | 8 | 240 | 1 | 11 | 11 | 26 | 9 | 85 | 143 | 383 |
| Archbald shaft, | | | | | | | | | | | | | | | |
| Sloan shaft, | 1 | 81 | 81 | 18 | 30 | 5 | 216 | 1 | 9 | 5 | 19 | 5 | 56 | 95 | 311 |
| Dodge shaft, | 1 | 62 | 58 | 17 | 18 | 5 | 161 | 1 | 12 | 14 | 21 | 6 | 56 | 110 | 271 |
| Scranton Coal Company's slope, | | | | | | | | | | | | | | | |
| Bellevue slope, | 1 | 46 | 48 | 15 | 14 | 4 | 128 | 2 | 13 | 14 | 44 | 10 | 92 | 175 | 439 |
| Bellevue shaft, | 1 | 51 | 51 | 16 | 12 | 5 | 136 | | | | | | | | |
| Hampton shaft, | 1 | 75 | 75 | 31 | 20 | 7 | 209 | 1 | 8 | 12 | 27 | 6 | 60 | 114 | 323 |
| Continental shaft, | 1 | 77 | 77 | 21 | 34 | 8 | 218 | 1 | 10 | 9 | 27 | 4 | 52 | 103 | 321 |
| Hyde Park shaft, | | | | | | | | | | | | | | | |
| Central shaft, | 1 | 89 | 92 | 17 | 30 | 8 | 237 | 1 | 7 | 6 | 27 | 4 | 55 | 100 | 337 |
| Oxford shaft, | | | | | | | | | | | | | | | |
| Diamond shaft, | 2 | 93 | 93 | 24 | 49 | 6 | 267 | 1 | 19 | 13 | 30 | 18 | 72 | 153 | 420 |
| Diamond slope, No. 2, | 1 | 47 | 47 | 14 | 24 | 4 | 137 | | 11 | 11 | 24 | 12 | 58 | 116 | 379 |
| Tripp's slope, | 1 | 40 | 39 | 18 | 24 | 4 | 126 | | | | | | | | |
| Brisbin shaft, | 1 | 77 | 73 | 17 | 24 | 8 | 200 | 1 | 7 | 8 | 21 | 4 | 53 | 94 | 294 |
| Cayuga Shaft, | 1 | 67 | 67 | 18 | 29 | 5 | 188 | 1 | 8 | 7 | 19 | 4 | 50 | 89 | 277 |
| Totals, Del., Lack. and West. R. R. Co., | 15 | 963 | 959 | 267 | 378 | 83 | 2,666 | 12 | 123 | 120 | 314 | 87 | 764 | 1,420 | 4,086 |

TABLE No. 7—*Continued.*—Pennsylvania Coal Company.

| NAMES OF THE COLLIERIES. | NUMBER OF PERSONS EMPLOYED INSIDE. | | | | | | | NUMBER OF PERSONS EMPLOYED OUTSIDE. | | | | | | | Grand totals inside and outside. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosses. | Miners. | Laborers. | All company men. | Drivers and runners. | Door boys. | Total inside. | Bosses. | Mechanics. | Head & plate men. | All company men. | Drivers and runners. | Slate pickers. | Total outside. | |
| No. 1 shaft, | . . | 20 | 20 | 2 | 2 | . . | 44 | . | 2 | 3 | 2 | 1 | 10 | 18 | 62 |
| No. 4 shaft, | 1 | 54 | 52 | 7 | 21 | 3 | 138 | 1 | 4 | 8 | 6 | . | 1 | 20 | 158 |
| No. 5 shaft, | 1 | 39 | 44 | 10 | 15 | 6 | 115 | 1 | 3 | 6 | 8 | 3 | 28 | 49 | 164 |
| No. 6 shaft, | 1 | 38 | 38 | 14 | 19 | 5 | 115 | 1 | 4 | 6 | 8 | 3 | 28 | 50 | 165 |
| No. 7 shaft, | 1 | 45 | 46 | 17 | 16 | 5 | 130 | 1 | 6 | 7 | 11 | . | 2 | 27 | 157 |
| No. 8 shaft, | 1 | 40 | 40 | 9 | 13 | 2 | 105 | 1 | 2 | 7 | 6 | 3 | 20 | 39 | 144 |
| No. 9 shaft, | 1 | 36 | 36 | 8 | 9 | 3 | 93 | 1 | 2 | 6 | 6 | 4 | 22 | 41 | 134 |
| No. 9 new shaft, | | | | | | | | | | | | | | | |
| No. 10 shaft, Seven feet vein, | 1 | 40 | 40 | 11 | 15 | 6 | 113 | 1 | 3 | 6 | 6 | 4 | 26 | 46 | 159 |
| No. 10 shaft, Fourteen feet vein, | 1 | 22 | 22 | 6 | 7 | . . . | 58 | 1 | 4 | 4 | 4 | 2 | 15 | 30 | 88 |
| No. 10 new shaft, | . . | 30 | 30 | 6 | 7 | 4 | 77 | . . | 2 | 4 | 5 | 2 | 16 | 29 | 106 |
| No. 11 shaft, | . . | 24 | 28 | 6 | 11 | 2 | 71 | 1 | 2 | 5 | 4 | 2 | 20 | 34 | 105 |
| No. 12 shaft, | 1 | 40 | 40 | 8 | 12 | 3 | 104 | 1 | 4 | 7 | 8 | 5 | 16 | 41 | 145 |
| No. 13 shaft, | 1 | 15 | 15 | 7 | 2 | . . . | 40 | | 3 | 3 | 4 | 2 | 6 | 18 | 58 |
| No. 2 slope, (Port Griffith,) | 1 | 28 | 28 | 11 | 11 | 1 | 80 | 1 | 4 | 6 | 5 | . . | 1 | 17 | 97 |
| No. 4 slope, | 1 | 44 | 46 | 9 | 18 | 4 | 122 | 1 | 3 | 6 | 7 | 5 | 1 | 23 | 145 |
| No. 6 slope, | . . | 20 | 20 | 6 | * 7 | 1 | 54 | 1 | 1 | 3 | 2 | 1 | 10 | 18 | 72 |
| Dawson's shaft, | . . | . . | . | . . | . . . | . . . | . . . | . . | . | . . | . . | . . . | . . | . | . |
| Stark's shaft, | 1 | 56 | 56 | 12 | 16 | 6 | 147 | 2 | 5 | 13 | 8 | 3 | 46 | 77 | 224 |
| Law's shaft, | 1 | 34 | 32 | 16 | 13 | 6 | 102 | 1 | 5 | 5 | 6 | 4 | 15 | 36 | 138 |
| No. 1 tunnel, | 1 | 34 | 34 | 8 | 6 | 2 | 85 | 1 | 3 | 5 | 4 | 1 | 1 | 15 | 100 |
| No. 2 slope, (Dunmore,) | 1 | 24 | 40 | 5 | 8 | 7 | 85 | 1 | 1 | 5 | 2 | 1 | . . | 10 | 95 |
| Gipsy Grove, No. 3 shaft, | . . | 30 | 38 | 4 | 10 | 5 | 87 | 1 | 1 | 5 | 9 | 2 | 35 | 53 | 140 |
| Gipsy Grove, No. 4 shaft, | 1 | 37 | 35 | 8 | 11 | 4 | 96 | . . | 1 | 1 | . . . | 2 | . | 4 | 100 |
| Totals, Pennsylvania Coal Company, . . . | 17 | 750 | 780 | 190 | 249 | 75 | 2,061 | 19 | 65 | 121 | 121 | 50 | 319 | 695 | 2,756 |

**Delaware and Hudson Canal Company.**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Von Storch slope, | 1 | 132 | 112 | 56 | 79 | 26 | 406 | 1 | 6 | 15 | 40 | 5 | 64 | 131 | 537 |
| Leggett's Creek shaft, | 1 | 97 | 63 | 12 | 42 | 12 | 227 | 1 | 8 | 7 | 27 | 4 | 40 | 87 | 314 |
| Marvine shaft, | 1 | 90 | 70 | 18 | 50 | 11 | 240 | 1 | 8 | 14 | 22 | 4 | 60 | 109 | 349 |
| Eddy's Creek shaft, | 1 | 105 | 28 | 19 | 24 | 9 | 186 | 1 | 7 | 10 | 29 | 7 | 48 | 102 | 288 |
| Grassy Island shaft, | 1 | 122 | 62 | 22 | 36 | 17 | 260 | 1 | 7 | 9 | 17 | 6 | 60 | 100 | 360 |
| White Oak colliery, | 1 | 108 | 68 | 12 | 40 | 10 | 239 | 1 | 4 | 3 | 10 | 4 | 76 | 98 | 337 |
| No. 1 shaft and White Bridge tunnel, | 1 | 128 | 75 | 13 | 36 | 12 | 265 | 1 | 3 | 8 | 23 | 1 | 4 | 40 | 305 |
| No. 3 shaft, | 1 | 48 | 8 | 10 | 18 | 6 | 91 | 1 | 3 | 8 | 11 | 1 | 4 | 28 | 119 |
| Coal Brook colliery—five tunnels, | 1 | 175 | 68 | 19 | 63 | 25 | 351 | 1 | 4 | 10 | 39 | 12 | 54 | 120 | 471 |
| Raekett Brook breaker, | . . | . . . | . . . | . | . . . | . . . | . . . | 1 | 1 | 4 | 16 | 6 | 56 | 84 | 84 |
| Totals, Del. and Hudson Canal Company, | 9 | 1,005 | 554 | 181 | 388 | 128 | 2,265 | 10 | 51 | 88 | 234 | 50 | 466 | 899 | 3,164 |

**Miscellaneous Companies.**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Everhart colliery, | 1 | 30 | 30 | 4 | 11 | . . . | 76 | 1 | 4 | 7 | 3 | 8 | 39 | 62 | 138 |
| Tompkins' shaft, | 1 | 11 | 11 | 2 | 2 | 1 | 28 | 1 | 2 | 2 | 4 | 1 | 12 | 22 | 50 |
| Seneca slope, | 2 | 43 | 40 | 11 | 27 | 6 | 129 | 1 | 3 | 6 | 18 | 4 | 55 | 87 | 216 |
| Ravine shaft, | . . | . . | . . | . . | . . | . . . | . . . | . . | 2 | . . . | 1 | 1 | . . . | 4 | 4 |
| Twin shaft, | 2 | 8 | 16 | 8 | 3 | . . . | 37 | 1 | 1 | . . . | 6 | 2 | 22 | 32 | 69 |
| Beaver colliery, | 1 | 4 | 4 | . . | 2 | 1 | 12 | 1 | 1 | 1 | 4 | 2 | 1 | 10 | 22 |
| Rock Hill tunnel, | 1 | 10 | 20 | 2 | 7 | . . . | 40 | 1 | 1 | 4 | 8 | 2 | 10 | 26 | 66 |
| Butler shaft, | 1 | 35 | 30 | 5 | 16 | 5 | 92 | 1 | 4 | 7 | 6 | 2 | 49 | 69 | 161 |
| Phœnix shaft, | 2 | 32 | 13 | 11 | 8 | 4 | 70 | 2 | 1 | 5 | 20 | 2 | 30 | 60 | 130 |
| Columbia colliery, | 1 | 11 | 11 | . . | 2 | 1 | 26 | 1 | 3 | 2 | 3 | 1 | 9 | 19 | 45 |
| Hillside colliery, | 1 | 50 | 50 | 35 | 30 | 10 | 176 | 1 | 6 | 12 | 20 | 10 | 30 | 79 | 255 |
| Spring Brook colliery, | 1 | 43 | 43 | 11 | 21 | 7 | 126 | 1 | 9 | 7 | 42 | 7 | 42 | 108 | 234 |
| Greenwood colliery, | 1 | 103 | 77 | 30 | 48 | 14 | 273 | 1 | 6 | 7 | 20 | 8 | 65 | 107 | 380 |
| Sibley shaft, | 1 | 50 | 45 | 15 | 24 | 4 | 139 | 1 | 6 | 5 | 22 | 2 | 62 | 98 | 237 |
| Meadow Brook colliery, | 1 | 70 | 50 | 13 | 19 | 9 | 162 | 1 | 11 | 5 | 10 | 6 | 59 | 92 | 254 |
| National colliery, | 2 | 68 | 49 | 14 | 27 | 10 | 170 | 1 | 4 | 4 | 12 | 4 | 66 | 91 | 261 |
| School Fund Association slope, | 2 | 34 | 34 | 10 | 14 | 8 | 102 | 3 | 4 | 5 | 16 | 4 | 60 | 92 | 194 |
| Mt. Pleasant slope, | 1 | 56 | 56 | 10 | 22 | 8 | 153 | 1 | 4 | 10 | 17 | 6 | 85 | 123 | 276 |
| Capouse shaft, | 1 | 105 | 98 | 46 | 28 | 20 | 298 | 1 | 12 | 7 | 22 | 4 | 60 | 106 | 404 |
| Pine Brook shaft, | 1 | 44 | 35 | 13 | 13 | 10 | 116 | 1 | 5 | 4 | 8 | 1 | 18 | 37 | 153 |
| Fairlawn slope, | 1 | 29 | 29 | 4 | 10 | 6 | 79 | 1 | 5 | 4 | 4 | 5 | 35 | 54 | 133 |
| Jermyn's Green Ridge shaft, | 1 | 78 | 78 | 25 | 16 | 14 | 212 | 1 | 6 | 8 | 10 | 3 | 60 | 88 | 300 |
| Green Ridge slope, | 1 | 45 | 50 | 15 | 25 | 12 | 148 | 1 | 10 | 10 | 31 | 6 | 49 | 110 | 258 |

TABLE No. 7.—Miscellaneous Companies—Continued.

| NAMES OF THE COLLIERIES. | NUMBER OF PERSONS EMPLOYED INSIDE. | | | | | | | NUMBER OF PERSONS EMPLOYED OUTSIDE | | | | | | | Grand totals inside and outside. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bosses. | Miners. | Laborers. | All company men. | Drivers and runners. | Boys. | Total inside. | Bosses. | Mechanics. | Head and plate men. | All company men. | Drivers and runners. | Slate pickers. | Total outside. | |
| Roaring Brook shaft, | 1 | 51 | 52 | 24 | 52 | 11 | 191 | 1 | 10 | 7 | 23 | 9 | 37 | 87 | 279 |
| Elk Hill colliery, | 1 | 23 | 18 | 3 | 14 | 6 | 65 | 1 | 4 | 7 | 8 | . . | 34 | 54 | 119 |
| Filer colliery, | 1 | 130 | 40 | 19 | 34 | 6 | 230 | 1 | 7 | 11 | 29 | 5 | 55 | 108 | 338 |
| Pierce colliery, | 1 | 83 | 53 | 3 | 18 | 7 | 165 | 1 | 2 | 4 | 28 | 4 | 65 | 104 | 269 |
| Eaton colliery, | 1 | 58 | 9 | 8 | 21 | 4 | 101 | 1 | 2 | 3 | 18 | 4 | 37 | 65 | 166 |
| Jermyn's slope, | 1 | 20 | 20 | 5 | 7 | 5 | 58 | 1 | . . . | 4 | 8 | 2 | 20 | 35 | 92 |
| Jermyn's shaft, | 1 | 120 | 100 | 14 | 20 | 6 | 261 | 1 | 10 | 4 | 10 | 4 | 40 | 69 | 330 |
| Erie shaft, | 1 | 70 | 45 | 15 | 28 | 14 | 173 | 1 | 6 | 11 | 21 | 2 | 37 | 78 | 251 |
| Forest City colliery, | 1 | 14 | 7 | 2 | 7 | 2 | 33 | . . | 2 | 2 | 3 | 2 | 3 | 12 | 45 |
| Total, miscellaneous companies, | 36 | 1,528 | 1,213 | 377 | 576 | 211 | 3,941 | 33 | 153 | 175 | 458 | 123 | 1,246 | 2,188 | 6,129 |

**Recapitulation.**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Delaware, Lackawanna and Western R. R. Co. | 15 | 963 | 959 | 267 | 338 | 83 | 2,665 | 12 | 123 | 120 | 314 | 87 | 764 | 1,420 | 4,085 |
| Pennsylvania Coal Company, | 17 | 750 | 780 | 190 | 248 | 75 | 2,061 | 19 | 65 | 121 | 121 | 50 | 319 | 695 | 2,756 |
| Delaware and Hudson Canal Company, | 9 | 1,005 | 554 | 181 | 388 | 128 | 2,265 | 10 | 51 | 83 | 234 | 50 | 466 | 899 | 3,164 |
| Miscellaneous companies, | 36 | 1,528 | 1,213 | 377 | 576 | 211 | 3,941 | 33 | 153 | 175 | 458 | 123 | 1,246 | 2,188 | 6,129 |
| Grand total of employés, | 77 | 4,246 | 3,507 | 1,015 | 1,590 | 499 | 10,933 | 74 | 402 | 504 | 1,127 | 310 | 2,795 | 5,202 | 16,099 |

TABLE No. 8.—*Machinery and Steam Power at each Colliery in the Eastern District during the year 1879.*

**Delaware, Lackawanna and Western Railroad Company.**

| Names of the Collieries. | Number of main rolls. | Number of pony rolls. | Number main screens. | Number pony screens. | Steam boilers. Number. | Steam boilers. Length in feet. | Steam boilers. Diameter in inches. | Hoisting engines ab. ground. Number. | Hoisting engines ab. ground. Horse power. | Breaker engines. Number. | Breaker engines. Horse power. | Fan engines. Number. | Fan engines. Horse power. | Pumping engines. Number. | Pumping engines. Horse power. | Donkey pumps. Number. | Donkey pumps. Horse power. | Hoisting engines under ground. Number. | Hoisting engines under ground. Horse power. | Total horse power of engines. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pyne shaft, | 4 | 2 | 6 | 2 | 12 | 30 | 34 | 2 | 300 | 1 | 60 | 1 | 40 | 1 | 250 | 2 | 20 | 1 | 10 | 680 |
| Taylor shaft and drift, | 2 | 2 | 2 | 2 | 12 | 30 | 34 | 2 | 120 | 1 | 40 | 1 | 40 | 1 | 110 | 2 | 50 | 1 | 30 | 390 |
| Archbald shaft, | 2 | 2 | 4 | 2 | 10 | 30 | 34 | 2 | 80 | 1 | 40 | 1 | 60 | 1 | 150 | . . . | . . . | . . . | . . . | 330 |
| Sloan shaft, | 2 | 2 | 4 | 6 | 12 | 30 | 40 | 2 | 120 | 1 | 60 | 1 | 40 | . . . | . . . | 2 | 50 | . . . | . . . | 270 |
| Dodge shaft, | 2 | 2 | 2 | 1 | 9 | 36 | 34 | 2 | 80 | 1 | 60 | 1 | 40 | 1 | 95 | 1 | 101 | . . . | . . . | 376 |
| Scranton Coal Company's slope, | 2 | 2 | 2 | 2 | 12 | 36 | 34 | 2 | 160 | 1 | 100 | 1 | 40 | 1 | 60 | . . . | . . . | . . . | . . . | 360 |
| Bellevue slope, | 4 | 2 | 4 | 6 | 12 | 38 | 34 | 2 | 120 | . . . | . . . | . . . | . . | . . . | . . . | 3 | 60 | 1 | 25 | 205 |
| Bellevue shaft, | | | | | 9 | 36 | 34 | 4 | 90 | 1 | 60 | 1 | 60 | 1 | 90 | 3 | 80 | 1 | 25 | 405 |
| Hampton shaft, | 2 | 2 | 4 | 2 | 13 | 40 | 34 | 2 | 80 | 1 | 60 | 1 | 25 | 1 | 90 | 1 | 20 | 1 | 30 | 360 |
| | | | | | 3 | 11 | 36 | | | | | | | | | | | | | |
| Continental shaft, | 2 | 4 | 2 | 4 | 9 | 40 | 34 | 2 | 120 | 1 | 40 | 1 | 40 | 1 | 60 | 3 | 200 | . . . | . . . | 460 |
| Hyde Park shaft, | 2 | 4 | 2 | 4 | . . . | | . . . | 2 | 120 | 1 | 60 | . . . | . . | 2 | 300 | . . . | . . . | . . . | . . . | 480 |
| Central shaft, | 2 | 2 | 2 | 2 | 12 | 30 | 34 | 2 | 120 | 1 | 60 | 1 | 40 | 2 | 300 | 2 | 40 | 1 | 30 | 590 |
| Oxford shaft, | . . . | . . . | . . . | . . . | 10 | 40 | 34 | 2 | 80 | 1 | 40 | . . . | . . . | . . . | . . . | 1 | 20 | . . . | . . . | 140 |
| | | | | | 4 | 26 | 30 | | | | | | | | | | | | | |
| Diamond shaft, | 2 | 2 | 4 | 1 | 23 | 36 | 34 | 4 | 160 | 2 | 100 | 1 | 40 | 4 | 360 | 2 | 40 | 1 | 30 | 730 |
| Diamond, No. 2 slope, | 2 | 4 | 2 | 4 | 9 | 40 | 32 | 1 | 60 | 1 | 40 | . . . | . . . | . . . | . . . | 3 | 200 | 1 | 40 | 340 |
| Tripp's slope, | . . . | . . . | . . . | . . . | 7 | 40 | 34 | 2 | 40 | . . . | . . . | . . . | . . . | . . . | . . . | 3 | 75 | . . . | . . . | 115 |
| Brisbin shaft, | 4 | 2 | 2 | 2 | 12 | 30 | 34 | 2 | 120 | 1 | 60 | 1 | 40 | . . . | . . . | 3 | 200 | . . . | . . . | 420 |
| Cayuga shaft, | 2 | 2 | 2 | 2 | 12 | 30 | 34 | 2 | 120 | 1 | 40 | 1 | 40 | 2 | 250 | 1 | 20 | . . | . . | 470 |
| Totals, D., L. and W. R. R. Co., | 36 | 36 | 44 | 44 | 202 | . . | . . . | 39 | 2,090 | 17 | 920 | 13 | 545 | 18 | 2,115 | 32 | 1,176 | 8 | 220 | 7,121 |

**Pennsylvania Coal Company.**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1 shaft, | . . . | . . . | . . . | . . . | 5 | 36 | 30 | 2 | 60 | . . . | . . . | 1 | 20 | . . . | . . . | . . | . . . | . . . | . . . | 80 |
| No. 4 shaft, | . . . | . . . | . . . | . . . | 7 | 36 | 30 | 1 | 40 | . . . | . . . | 1 | 20 | 1 | 40 | 1 | 10 | 2 | 40 | 150 |
| No. 5 shaft, | . . . | . . . | . . . | . . . | 3 | 36 | 30 | 1 | 40 | . . . | . . . | 1 | 20 | . . . | . . . | 1 | 10 | . . . | . . . | 70 |
| No. 6 shaft, | 2 | . . . | 4 | . . . | 6 | 36 | 30 | 1 | 40 | 1 | 25 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 65 |
| No. 7 shaft, | . . . | . . . | . . . | . . . | 5 | 36 | 30 | 1 | 40 | . . . | . . . | . . . | . . . | 1 | 120 | 1 | 20 | 2 | 40 | 220 |
| No. 8 shaft, | 2 | . . . | 4 | . . . | 5 | 36 | 34 | 1 | 40 | 1 | 25 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 65 |
| No. 9 shaft, | . . | . . . | . . . | . . . | 3 | 36 | 30 | 1 | 40 | . . . | . . . | 1 | 20 | . . | . . . | . | . . . | . . . | . . . | 60 |
| No. 9 shaft, (new,) | | | | | | | | | | | | | | | | | | | | |
| No. 10 shaft, | 2 | . . . | 8 | . . . | 6 | 36 | 30 | 4 | 100 | 1 | 40 | . . . | . . . | 1 | 30 | 1 | 10 | 1 | 25 | 205 |

TABLE No. 8.—Pennsylvania Coal Company—Continued.

| NAMES OF THE COLLIERIES. | Number of main rolls. | Number of pony rolls. | Number main screens. | Number pony screens. | *Steam boilers.* Number. | Length in feet. | Diameter in inches. | *Hoisting engines ab. ground.* Number. | Horse power. | *Breaker engines.* Number. | Horse power. | *Fan engines.* Number. | Horse power. | *Pumping engines.* Number. | Horse power. | *Donkey pumps.* Number. | Horse power. | *Hoisting engines under ground.* Number. | Horse power. | Total horse power of engines. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 10 shaft, (new,) | | | | | 6 | 36 | 30 | 2 | 60 | | | 1 | 20 | 1 | 40 | 1 | 20 | | | 140 |
| No. 11 shaft, | | | | | 3 | 36 | 30 | 1 | 40 | | | | | | | 1 | 10 | | | 50 |
| No. 12 shaft, | 2 | | 4 | | 6 | 36 | 30 | 1 | 40 | 1 | 40 | | | | | | | | | 80 |
| No. 13 shaft, | | | | | 5 | 36 | 30 | 1 | 40 | | | 1 | 20 | 2 | 80 | | | | | 140 |
| No. 2 slope, (Port Griffith,) | | | | | 6 | 46 | 30 | 1 | 40 | | | | | | | 2 | 130 | | | 170 |
| No. 4 slope, | | | | | 5 | 36 | 30 | 3 | 60 | | | | | | | 1 | 20 | | | 80 |
| No. 6 slope, | | | | | | | | 1 | 25 | | | | | | | | | | | 25 |
| Dawson's shaft. | | | | | | | | | | | | | | | | | | | | |
| Stark's shaft, | 2 | | 4 | | 5 | 36 | 30 | 1 | 40 | 1 | 25 | | | | | | | 4 | 60 | 125 |
| Law's shaft, | | | | | 11 | 36 | 30 | 1 | 40 | | | 1 | 20 | 1 | 40 | 2 | 120 | | | 220 |
| No. 1 tunnel, | | | | | 3 | 36 | 30 | 2 | 40 | | | | | | | 1 | 20 | | | 60 |
| No. 2 slope, (Dunmore,) | | | | | 3 | 36 | 30 | 2 | 32 | | | | | 1 | 20 | 1 | 6 | | | 58 |
| Gipsey Grove, No. 3, shaft, | 1 | | 4 | | 4 | 36 | 30 | 1 | 20 | 1 | 20 | | | 2 | 65 | | | | | 105 |
| Gipsey Grove, No. 4, shaft, | | | | | 3 | 36 | 30 | 1 | 20 | | | 1 | 15 | | | | | | | 35 |
| Totals, Pennsylvania Coal Company, | 11 | | 28 | | 110 | | | 30 | 895 | 6 | 175 | 8 | 155 | 10 | 435 | 13 | 376 | 9 | 165 | 2,201 |
| **Delaware and Hudson Canal Company.** | | | | | | | | | | | | | | | | | | | | |
| Von Storch slope, | 2 | 4 | 8 | 4 | 23 | 36 | 34 | 3 | 260 | 1 | 61 | 1 | 72 | 2 | 138 | | | | | 531 |
| Leggett's Creek shaft, | 2 | 2 | 3 | 2 | 14 | 30 | 34 | 2 | 210 | 1 | 61 | 1 | 49 | 1 | 77 | | | 1 | 18 | 415 |
| Marvine shaft, | 2 | 2 | 2 | 2 | 12 | 36 | 34 | 2 | 200 | 1 | 61 | 1 | 49 | 1 | 120 | | | | | 430 |
| Eddy Creek shaft, | 2 | | 4 | | 15 | 36 | 34 | 3 | 174 | 1 | 30 | 1 | 72 | 1 | 77 | 1 | 30 | | | 383 |
| Grassy Island shaft, | 2 | 2 | 4 | 2 | 12 | 36 | 34 | 1 | 60 | 1 | 61 | | | 1 | 77 | | | 1 | 25 | 223 |
| White Oak colliery, | 2 | 4 | 2 | 4 | 6 | 36 | 34 | | | 1 | 61 | | | | | | | | | 61 |
| No. 1 shaft, and White Bridge tunnel, | | | | | 7 | 36 | 34 | | | | | 1 | 30 | 1 | 61 | | | | | 91 |
| No. 3 shaft, | | | | | 9 | 36 | 34 | 1 | 72 | | | 1 | 30 | 2 | 100 | | | | | 202 |
| Coal Brook colliery, (five tunnels,) | 2 | 4 | 6 | 8 | 7 | 36 | 34 | 1 | 60 | 1 | 77 | 1 | 30 | | | | | | | 167 |
| Rackett Brook breaker, | 2 | 2 | 4 | 2 | 5 | 36 | 34 | | | 1 | 77 | | | | | | | | | 77 |
| Totals, Del. and Hud. Canal Co., | 16 | 22 | 33 | 25 | 110 | | | 13 | 1,036 | 8 | 489 | 7 | 332 | 9 | 650 | 1 | 30 | 2 | 43 | 2,580 |
| **Miscellaneous Companies.** | | | | | | | | | | | | | | | | | | | | |
| Everhart colliery, | 2 | 2 | 1 | 1 | 5 | 30 | 34 | | | 1 | 60 | | | | | 2 | 23 | | | 83 |
| Tompkin's shaft, | 2 | 2 | 1 | 1 | 6 | 30 | 30 | 1 | 45 | 1 | 30 | 1 | 8 | 1 | 40 | 1 | 15 | | | 138 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seneca slope, | 2 | 2 | 1 | 1 | 8 | 30 | 30 | 1 | 60 | 1 | 40 | 1 | 20 | 1 | 60 | . . . | . . . | . . . | . . . | 180 |
| Ravine shaft, | 2 | 2 | 2 | . . | 4 | 30 | 30 | 1 | 60 | 1 | 40 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 100 |
| Twin shaft, | 2 | 2 | 1 | 1 | 9 | 30 | 30 | 1 | 60 | 1 | 40 | 1 | 20 | . . | . . . | 3 | 70 | . . | . . . | 190 |
| Beaver colliery, | . . . | . . . | 1 | . . . | 2 | 34 | 30 | . . . | . . . | 1 | 20 | . . . | . . . | . . | . . . | . . | . . . | . . . | . . . | 20 |
| Rock Hill tunnel, | 2 | 2 | 1 | 1 | 2 | 20 | 30 | . . . | . . . | 1 | 30 | . . . | . . . | . . | . . . | . . | . . . | . . . | . . . | 30 |
| Butler shaft, | 2 | 4 | 2 | 6 | 3 | 39 | 30 | 1 | 40 | 1 | 40 | . . . | . . . | . . | . . . | 2 | 50 | 1 | 25 | 145 |
| | | | | | 4 | 29 | 30 | | | | | | | | | | | | | |
| Phœnix shaft, | 2 | 2 | 1 | 2 | 6 | 36 | 34 | 1 | 60 | 1 | 40 | 1 | 12 | . . . | . . . | 1 | 60 | . . . | . . . | 172 |
| Columbia colliery, | . . . | . . . | 1 | . . . | 2 | 31 | 30 | . . . | . . . | 1 | 50 | . . . | . . . | . . | . . . | . . | . . . | . . . | . . . | 50 |
| Hillside colliery, | 2 | 2 | 6 | 2 | 10 | 30 | 30 | 2 | 80 | 2 | 85 | . . . | . . . | . . | . . . | 3 | 35 | 2 | 35 | 235 |
| Spring Brook colliery, | 2 | 2 | 3 | 1 | 8 | 30 | 30 | 4 | 167 | 1 | 25 | 1 | 10 | . . . | . . . | 4 | 50 | . . . | . . . | 252 |
| | | | | | 2 | 36 | 34 | | | | | | | | | | | | | |
| Greenwood colliery, | 2 | 4 | 8 | 3 | 13 | 30 | 30 | 2 | 90 | 2 | 120 | . . . | . . . | 1 | 40 | 3 | 20 | . . . | . . . | 270 |
| Sibley shaft, | 4 | 2 | 4 | 2 | 8 | 30 | 30 | 2 | 90 | 1 | 45 | 2 | 40 | . . . | . . . | 4 | 50 | . . . | . . . | 225 |
| Meadow Brook colliery, | 2 | 2 | 4 | 2 | 3 | 34 | 34 | 1 | 100 | 1 | 45 | 1 | 26 | . . . | . . . | 2 | 60 | 1 | 52 | 283 |
| | | | | | 6 | 32 | 32 | | | | | | | | | | | | | |
| National colliery, | 2 | 2 | 4 | 2 | 4 | 34 | 32 | 1 | 52 | 1 | 40 | . . . | . . . | . . | . . . | . . | . . . | . . . | . . . | 92 |
| School Fund Association slope, | 2 | 2 | 3 | 1 | 5 | 30 | 30 | 4 | 140 | 1 | 35 | 2 | 30 | . . . | . . . | 4 | 40 | 1 | 10 | 255 |
| | | | | | 15 | 30 | 34 | | | | | | | | | | | | | |
| Mt. Pleasant slope, | 2 | 2 | 6 | 2 | 0 | 30 | 30 | 2 | 100 | 1 | 40 | 1 | 20 | . . . | . . . | 4 | 100 | . . . | . . . | 260 |
| | | | | | 2 | 15 | 48 | | | | | | | | | | | | | |
| Capouse shaft, | 2 | 2 | 6 | 2 | 12 | 30 | 36 | 4 | 200 | 1 | 40 | 2 | 70 | 1 | 60 | 2 | 35 | . . . | . . . | 405 |
| Pine Brook shaft, | . . . | . . . | 2 | . . . | 3 | 24 | 30 | 2 | 60 | 1 | 60 | . . . | . . . | 1 | 60 | 1 | 20 | . . . | . . . | 200 |
| | | | | | 6 | 36 | 30 | | | | | | | | | | | | | |
| Fairlawn slope, | 2 | 2 | 1 | 2 | 4 | 30 | 30 | 2 | 65 | 1 | 35 | 1 | 8 | . . . | . . . | 1 | 8 | . . . | . . . | 116 |
| Jermyn's Green Ridge shaft, | 2 | 2 | 2 | 4 | 12 | 36 | 34 | 4 | 200 | 1 | 60 | 2 | 115 | . . . | . . . | 4 | 64 | 1 | 25 | 464 |
| Green Ridge slope, | 2 | 2 | 3 | 1 | 9 | 40 | 34 | 2 | 130 | 1 | 60 | 1 | 25 | . . . | . . . | 3 | 45 | 1 | 30 | 290 |
| Roaring Brook shaft, | 2 | . . . | 2 | . . | 13 | 36 | 34 | 5 | 60 | 1 | 40 | . . . | . . . | 1 | 90 | . . . | . . . | . . . | . . . | 190 |
| Elk Hill colliery, | 2 | 2 | 2 | 2 | 2 | 50 | 30 | . . . | . . . | 1 | 40 | . . . | . . . | 1 | 12 | . . . | . . . | . . . | . . . | 52 |
| Filer colliery, | 2 | 2 | 2 | 4 | 12 | 30 | 30 | 4 | 120 | 1 | 30 | . . . | . . . | . . . | . . . | 4 | 60 | . . . | . . . | 210 |
| Pierce colliery, | 2 | 2 | 2 | . . . | 3 | 36 | 34 | . . . | . . . | 1 | 40 | 1 | 20 | . . . | . . . | . . . | . . . | . . . | . . . | 60 |
| | | | | | 1 | 18 | 48 | | | | | | | | | | | | | |
| Eaton colliery, | 2 | . . . | 2 | 2 | 3 | 40 | 34 | 3 | 90 | 1 | 25 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 115 |
| | | | | | 3 | 36 | 34 | | | | | | | | | | | | | |
| Jermyn's slope, | 2 | . . . | 2 | . . . | 4 | 36 | 34 | 2 | 50 | 1 | 25 | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | 75 |
| Jermyn's shaft, | 2 | . . | 2 | . . . | 9 | 36 | 34 | 2 | 120 | 1 | 30 | . . | . . . | . . . | . . . | . . . | . . . | 3 | 45 | 195 |
| Erie shaft, | 2 | 2 | 4 | 1 | 9 | 31 | 34 | 2 | 60 | 1 | 20 | 1 | 35 | 1 | 60 | 3 | 45 | 2 | 40 | 270 |
| Forest City colliery, | . . . | . . | 1 | | | | | | | | | | | | | | | | | |
| Totals, miscellaneous companies, | 58 | 52 | 83 | 46 | 232 | . . . | . . . | 56 | 2,209 | 33 | 1,310 | 19 | 459 | 8 | 422 | 51 | 850 | 12 | 262 | 5,622 |

**Recapitulation.**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Del., Lack. and Western R. R. Co., | 36 | 36 | 44 | 41 | 202 | . . . | . . | 39 | 2,090 | 17 | 920 | 13 | 545 | 18 | 2,115 | 32 | 1,176 | 8 | 220 | 7,121 |
| Pennsylvania Coal Company, | 11 | . . . | 28 | . . . | 110 | . . . | . . . | 30 | 895 | 6 | 175 | 8 | 155 | 10 | 435 | 13 | 376 | 9 | 165 | 2,201 |
| Delaware and Hudson Canal Company, | 16 | 22 | 33 | 25 | 110 | . . . | . . . | 13 | 1,036 | 8 | 489 | 7 | 332 | 9 | 650 | 1 | 30 | 2 | 43 | 2,580 |
| Miscellaneous companies, | 58 | 52 | 83 | 46 | 232 | . . . | . . | 56 | 2,209 | 33 | 1,340 | 19 | 459 | 8 | 422 | 51 | 850 | 12 | 262 | 5,622 |
| Grand totals, | 121 | 110 | 188 | 115 | 654 | . . | . . . | 138 | 6,230 | 64 | 2,924 | 47 | 1,491 | 45 | 3,722 | 97 | 2,432 | 31 | 690 | 17,524 |

**TABLE No. 9** —*Showing the quantity of air at the downcast, at the face of the workings, and number of persons, and quantity of air for each person in each split in for the year ending December 31, 1879.*

| NAMES OF THE COLLIERIES. | How the ventilation is produced. | Total cubic feet of air per minute at downcast. | CUBIC FEET PER MINUTE OF AIR NEAR THE FACE IN EACH SPLIT. | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | No. 1 | No 2 | No. 3 | No. 4. | No. 5. | No. 6. |
| Pyne shaft, | Fan, | 143,783 | 28,728 | 17,756 | 17,775 | 23,322 | 21,315 | 13,960 |
| Taylor drift, | Furnace, | 29,600 | 27,000 | | | | | |
| Taylor shaft, | Two fans, | 139,200 | 18,600 | 24,700 | 24,900 | 26,000 | 24,200 | 18,000 |
| Sloan shaft, | Fan, | 118,305 | 20,562 | 19,775 | 21,844 | 18,680 | 23,675 | |
| Dodge shaft, | Fan, | 69,190 | 25,456 | 23,546 | 17,762 | | | |
| Bellevue slope, | Fan, | 59,600 | 9,580 | 13,870 | 9,540 | | | |
| Bellevue shaft, | Fan, | 77,015 | 7,120 | 12,380 | 19,675 | 15,116 | 13,890 | |
| Hampton shaft, | Fan, | 62,600 | 6,000 | 16,350 | 17,400 | 15,500 | | |
| Continental shaft, | Fan, | 106,200 | 19,450 | 17,275 | 16,000 | 24,650 | 23,710 | |
| Central shaft, | Fan, | 78,280 | 11,520 | 14,760 | 10,870 | 13,920 | 19,090 | |
| No. 2, Diamond shaft, (E vein,) | Two fans | 30,360 | 14,765 | 10,515 | | | | |
| No. 2, Diamond shaft, (G vein,) | Two fans | 47,000 | 13,896 | 17,145 | 14,680 | | | |
| No. 2, Diamond slope, | Furnace, | 36,720 | 8,430 | 10,870 | 12,740 | | | |
| Tripp's slope, | Fan, | 24,105 | 9,140 | | | | | |
| Brisbin shaft, | Fan, | 93,489 | 18,340 | 19,060 | 17,640 | 17,320 | 13,300 | |
| Cayuga shaft, | Fan, | 58,650 | 14,420 | 16,380 | 15,620 | | | |
| Von Storch slope, (E vein,) | Fan, | 18,500 | 5,900 | 9,400 | | | | |
| Von Storch slope, (G vein,) | Fan, | 25,200 | 7,000 | 6,500 | 9,700 | | | |
| Von Storch slope, (Clark vein,) | Fan, | 32,300 | 12,700 | 3,000 | 9,400 | | | |
| Leggett's Creek shaft, | Fan, | 85,000 | 16,000 | 14,200 | 12,200 | 11,500 | | |
| Marvine shaft, | Fan, | 80,000 | 25,320 | 24,400 | 23,310 | | | |
| Eddy Creek shaft, | Fan, | 46,850 | 11,700 | 10,275 | 9,360 | | | |
| Grassy Island shaft, | Furnace, | 45,000 | 8,000 | 3,000 | 14,500 | | | |
| White Oak colliery, | Furnace, | 32,500 | 16,000 | | | | | |
| No. 1 shaft, | Fan, | 58,600 | 22,400 | 11,900 | | | | |
| White Bridge tunnel, | Fan, | 21,500 | 11,900 | | | | | |
| No. 3 shaft, | Fan, | 18,950 | 9,500 | | | | | |
| Coal Brook colliery, | Fan, | 69,400 | 24,000 | 22,500 | | | | |
| No. 1 shaft, (Penn'a Coal Co.,) | Fan, | 16,460 | 6,840 | 8,100 | | | | |
| No. 4 shaft, P. C. Co., (14 ft. vein,) | Fan and | 32,850 | 4,310 | 3,713 | 5,116 | 3,340 | | |
| No. 4 shaft, do. (Marcy vein,) | natural, | 30,210 | 10,500 | 11,600 | | | | |
| No. 5 shaft, | Fan, | 45,400 | 16,600 | 11,300 | | | | |
| No. 6 shaft, | Fan&steam | 40,187 | 6,075 | 7,000 | 12,096 | | | |
| No. 7 shaft, | Fan, | 31,550 | 8,450 | 16,437 | | | | |
| No. 8 shaft, | Fan, | 34,170 | 13,170 | 11,000 | | | | |
| No. 9 shaft, | Fan, | 51,550 | 21,000 | 21,790 | | | | |
| No. 10 shaft, (7 feet vein,) | Fan, | 29,400 | 15,600 | 7,800 | 3,600 | | | |
| No. 10 shaft, (14 feet vein,) | Fan, | 32,000 | 14,100 | 11,200 | | | | |
| No. 10, New shaft, | Fan, | 32,800 | 11,400 | 11,800 | | | | |
| No. 11 shaft, | Natural, | 18,300 | 11,200 | | | | | |
| No. 12 shaft, | Natural, | 32,470 | 8,000 | 12,300 | | | | |
| No. 13 shaft, | Fan, | 43,584 | 16,020 | 12,420 | | | | |
| No. 2 slope, | Steam, | 25,215 | 10,150 | 9,262 | 4,175 | | | |
| No. 4 slope, | Natural, | 16,000 | 6,000 | 5,400 | | | | |
| No. 6 slope, | Furnace, | 13,320 | 3,000 | 7,170 | | | | |
| Stark shaft, | Natural, | 31,210 | 9,735 | 6,045 | 4,618 | 4,016 | | |
| Law shaft, | Fan, | 44,730 | 21,500 | 12,600 | | | | |
| No. 1 tunnel, | Natural, | 18,400 | 13,040 | | | | | |
| No. 2 slope, (Dunmore,) | Furnace, | 30,668 | 7,480 | 8,635 | 6,041 | | | |
| Gipsey Grove, No. 3 shaft, | Fan, | 21,713 | 9,252 | 10,206 | | | | |
| Gipsey Grove, No. 4 shaft, | Fan, | 32,203 | 11,379 | 9,594 | 9,146 | | | |
| Everhart colliery, | Natural, | 29,691 | 6,700 | 7,081 | 7,275 | | | |
| Tompkins' shaft, | Fan, | 12,165 | 4,400 | 2,295 | | | | |
| Seneca slope, | Fan, | 57,350 | 15,000 | | | | | |
| Twin shaft, | Fan, | 10,000 | 7,400 | | | | | |
| Beaver colliery, | Natural, | 10,800 | 2,300 | | | | | |
| Butler shaft, | Fan, | 41,000 | 32,000 | | | | | |
| Phœnix shaft, | Fan, | 21,600 | 2,800 | 10,800 | | | | |
| Columbia colliery, | Furnace, | 3,150 | 3,000 | | | | | |
| Hillside colliery, | Furnace, | 35,000 | 20,600 | 9,400 | | | | |
| Powder-Mill shaft, | Fan, | 38,800 | 33,700 | | | | | |
| Spring Brook tunnel, | Furnace, | 12,300 | 6,100 | | | | | |
| Greenwood colliery, No. 10 drift, | Furnace, | 12,852 | 8,000 | | | | | |
| Greenwood colliery, No. 11 drift, | Furnace, | 13,200 | 7,300 | | | | | |
| Greenwood colliery, slope, | Furnace, | 18,500 | 9,640 | | | | | |
| Sibley shaft, | Fan, | 40,000 | 9,460 | 6,750 | | | | |
| Meadow Brook shaft, | Fan, | 65,300 | 27,690 | 29,170 | | | | |
| Meadow Brook tunnel, | Furnace, | 34,370 | 16,120 | 15,130 | | | | |
| National colliery, | Furnace, | 24,065 | 3,492 | 5,520 | 12,050 | | | |
| School Fnud slope, | Fan, | 48,220 | 17,430 | 16,460 | | | | |

*ings, and at the upcast, the number of splits into which the air is divided, quantity every colliery in operation in the Eastern District of Luzerne and Carbon counties,*

| Total cubic feet of air per minute near the face. | NUMBER OF PERSONS EMPLOYED IN EACH SPLIT. | | | | | | CUBIC FEET PER MINUTE OF AIR FOR EACH PERSON IN EACH SPLIT. | | | | | | Total cubic feet of air per minute at the upcast. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. | No. 6. | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. | No. 6 | |
| 122,856 | 39 | 30 | 23 | 42 | 38 | 30 | 736.6 | 592.5 | 777.7 | 555.3 | 561 | 465.3 | 147,260 |
| 27,000 | 43 | | | | | | 628 | | | | | | 34,000 |
| 136,400 | 31 | 41 | 40 | 35 | 18 | | 600 | 602.4 | 622.5 | 743 | 1,344 | | 143,000 |
| 104,536 | 38 | 42 | 48 | 30 | 28 | | 541 | 471 | 455 | 623 | 845.5 | | 123,974 |
| 66,764 | 47 | 35 | 50 | | | | 541.6 | 672.7 | 355.2 | | | | 73,520 |
| 32,990 | 23 | 50 | 43 | | | | 416.5 | 277.4 | 222 | | | | 63,260 |
| 68,181 | 4 | 31 | 34 | 15 | 30 | | 1,780 | 399 | 578.6 | 1,008 | 463 | | 81,315 |
| 55,250 | 9 | 12 | 47 | 49 | | | 665.6 | 1,362 | 370 | 316.3 | | | 66,878 |
| 101,085 | 34 | 28 | 38 | 38 | 44 | | 572 | 617 | 421 | 649 | 539 | | 109,275 |
| 70,160 | 48 | 47 | 40 | 44 | 46 | | 240 | 314 | 272 | 316.3 | 415 | | 82,352 |
| 25,380 | 64 | 40 | | | | | 230 | 262.8 | | | | | 33,045 |
| 45,711 | 21 | 41 | 46 | | | | 661.7 | 418 | 319 | | | | 49,160 |
| 32,040 | 31 | 36 | 32 | | | | 272 | 302 | 398 | | | | 39,120 |
| 9,140 | 116 | | | | | | 78.9 | | | | | | 29,850 |
| 86,160 | 34 | 43 | 39 | 42 | 23 | | 539.4 | 443.2 | 452.4 | 412.4 | 600 | | 160,544 |
| 46,420 | 49 | 47 | 48 | | | | 294 | 334.5 | 325.4 | | | | 65,460 |
| 15,300 | 39 | 48 | | | | | 151.3 | 196 | | | | | 19,735 |
| 23,200 | 50 | 48 | 50 | | | | 140 | 135.4 | 194 | | | | 28,647 |
| 25,100 | 50 | 32 | 48 | | | | 254 | 93.7 | 196 | | | | 34,940 |
| 53,900 | 42 | 44 | 48 | 45 | | | 381 | 322.7 | 254 | 255.5 | | | 87,384 |
| 73,030 | 96 | 94 | 50 | | | | 263.7 | 259.6 | 466.2 | | | | 83,870 |
| 31,335 | 29 | 69 | 57 | | | | 403.4 | 149 | 164.2 | | | | 49,410 |
| 25,500 | 80 | 24 | 100 | | | | 100 | 125 | 145 | | | | 47,940 |
| 16,000 | 195 | | | | | | 82 | | | | | | 35,450 |
| 34,300 | 150 | 60 | | | | | 149 | 196.7 | | | | | 62,500 |
| 11,900 | 156 | | | | | | 79.3 | | | | | | 22,500 |
| 9,500 | 75 | | | | | | 126.7 | | | | | | 20,440 |
| 46,500 | 150 | 125 | | | | | 160 | 180 | | | | | 72,500 |
| 14,940 | 27 | 18 | | | | | 253 | 450 | | | | | 17,370 |
| 16,479 | 21 | 16 | 28 | 13 | | | 205 | 232 | 183 | 257 | | | 33,547 |
| 22,100 | 25 | 22 | | | | | 420 | 527 | | | | | 31,398 |
| 27,900 | 62 | 52 | | | | | 267.7 | 217.3 | | | | | 51,050 |
| 25,171 | 55 | 41 | 13 | | | | 110 | 170 | 930 | | | | 42,998 |
| 22,887 | 43 | 66 | | | | | 196.5 | 249 | | | | | 33,325 |
| 24,170 | 53 | 47 | | | | | 248.5 | 234.2 | | | | | 34,470 |
| 42,790 | 40 | 46 | | | | | 525 | 473.7 | | | | | 52,290 |
| 27,000 | 54 | 28 | 16 | | | | 288.8 | 278.6 | 225 | | | | 31,735 |
| 25,300 | 27 | 22 | | | | | 522 | 509 | | | | | 33,146 |
| 23,200 | 34 | 42 | | | | | 300 | 281 | | | | | 34,438 |
| 11,200 | 53 | | | | | | 211.3 | | | | | | 19,715 |
| 20,300 | 48 | 50 | | | | | 166.6 | 246 | | | | | 35,250 |
| 28,440 | 15 | 18 | | | | | 1,068 | 690 | | | | | 45,816 |
| 23,587 | 46 | 23 | 10 | | | | 220 | 402.7 | 417.5 | | | | 28,261 |
| 11,400 | 45 | 45 | | | | | 133.3 | 120 | | | | | 17,362 |
| 10,170 | 7 | 43 | | | | | 428.5 | 166 | | | | | 14,790 |
| 24,414 | 35 | 62 | 33 | 13 | | | 278 | 97.5 | 140 | 309 | | | 32,625 |
| 34,160 | 46 | 47 | | | | | 467.4 | 268 | | | | | 47,740 |
| 13,040 | 77 | | | | | | 169.3 | | | | | | 19,420 |
| 22,156 | 57 | 17 | 7 | | | | 131.2 | 508 | 863 | | | | 32,350 |
| 19,458 | 27 | 41 | | | | | 342.7 | 249 | | | | | 57,916 |
| 30,119 | 54 | 35 | 12 | | | | 211 | 274 | 762 | | | | |
| 21,056 | 8 | 22 | 46 | | | | 837.5 | 322 | 158 | | | | 31,140 |
| 6,695 | 16 | 12 | | | | | 275 | 191 | | | | | 13,465 |
| 15,060 | 130 | | | | | | 115.4 | | | | | | 58,917 |
| 7,400 | 14 | | | | | | 528 | | | | | | 12,100 |
| 2,300 | 12 | | | | | | 192 | | | | | | 11,000 |
| 32,000 | 92 | | | | | | 347.8 | | | | | | 43,350 |
| 13,600 | 23 | 47 | | | | | 122 | 230 | | | | | 22,400 |
| 3,000 | 26 | | | | | | 115 | | | | | | 3,675 |
| 30,000 | 144 | 32 | | | | | 143 | 294 | | | | | 37,457 |
| 33,700 | 42 | | | | | | 802 | | | | | | 39,100 |
| 6,100 | 84 | | | | | | 72.6 | | | | | | 13,173 |
| 8,000 | 86 | | | | | | 93 | | | | | | 13,217 |
| 7,300 | 68 | | | | | | 107.3 | | | | | | 13,941 |
| 9,640 | 118 | | | | | | 81.7 | | | | | | 18,987 |
| 16,210 | 100 | 39 | | | | | 94.6 | 173 | | | | | 40,913 |
| 56,860 | 78 | 84 | | | | | 355 | 359 | | | | | 68,140 |
| 31,250 | 70 | 50 | | | | | 230 | 302.6 | | | | | 35,410 |
| 21,062 | 7 | 22 | 14 | | | | 499 | 251 | 861 | | | | 24,384 |
| 33,890 | 26 | 74 | | | | | 670 | 222 | | | | | 49,711 |

TABLE No. 9—

| NAMES OF THE COLLIERIES. | How the ventilation is produced. | Total cubic feet of air per minute at downcast. | CUBIC FEET PER MINUTE OF AIR NEAR THE FACE IN EACH SPLIT. | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. | No. 6. |
| Mount Pleasant slope, | Fan, | 34,700 | 13,200 | 9,700 | 8,300 | | | |
| Caponse shaft, | Fan, | 93,400 | 7,200 | 10,700 | 10,100 | 10,400 | 9,200 | 10,350 |
| Pine Brook shaft, | Furnace, | 54,210 | 14,040 | 9,000 | 11,870 | | | |
| Fairlawn slope, | Fan, | 22,350 | 7,463 | | | | | |
| Jermyn's Green Ridge shaft, | Fan, | 100,560 | 23,730 | 20,710 | 21,370 | 23,712 | | |
| Green Ridge slope, | Fan, | 45,040 | 13,430 | 9,326 | 11,240 | | | |
| Roaring Brook shaft, | Furnace, | 44,380 | 11,200 | 15,400 | 13,980 | | | |
| Elk Hill colliery, | Furnace, | 20,000 | 13,000 | | | | | |
| Filer colliery, | Furnace, | 32,690 | 9,241 | 7,345 | 11,104 | | | |
| Eaton colliery, | Furnace, | 15,495 | 8,560 | | | | | |
| Pierce colliery, | Fan, | 28,800 | 21,180 | | | | | |
| Jermyn's, No. 1 shaft, | Furnace, | 24,500 | 9,180 | | | | | |
| Jermyn's slope, | Furnace, | 17,840 | 7,140 | | | | | |
| Erie shaft, | Fan, | 72,600 | 17,030 | 16,350 | | | | |
| Forest City colliery, | Furnace, | 16,800 | 6,400 | | | | | |

Continued.

| Total cubic feet of air per minute near the face. | NUMBER OF PERSONS EMPLOYED IN EACH SPLIT. | | | | | | CUBIC FEET PER MINUTE OF AIR FOR EACH PERSON IN EACH SPLIT. | | | | | | Total cubic feet of air per minute at the upcast. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No 1. | No. 2. | No 3. | No. 4. | No. 5. | No. 6. | No. 1. | No. 2. | No. 3. | No. 4 | No. 5. | No. 6. | |
| 31,200 | 48 | 48 | 49 | . . . | . . . | . . . . | 275 | 202 | 169.4 | . . . . | . . . . | . . . . | 35,350 |
| 57,950 | 49 | 40 | 48 | 40 | 29 | 46 | 147 | 267.5 | 210 | 258 | 317 | 225 | 102,500 |
| 24,910 | 18 | 36 | 47 | . . | . . . | . . . . | 769 | 250 | 252.5 | . . . . | . . . . | . . . . | 59,400 |
| 7,463 | 79 | . . . | . . . | . . . | . . . . | . . . | 94.4 | . . . | . . . . | . . . | . . . . | . . . | 23.476 |
| 89,522 | 47 | 47 | 32 | 41 | . . . . | . . . | 505 | 440 | 667.8 | 578.3 | . . . | . . . . | 104,158 |
| 33,996 | 42 | 30 | 49 | . . . | . . . | . . . . | 319.7 | 310 | 229.3 | . . . . | . . . . | . . . . | 47,365 |
| 40,580 | 10 | 87 | 67 | . | . . . . | . . . . | 1,120 | 177 | 208.6 | . . . . | . . . . | . . . . | 45,970 |
| 13,000 | 64 | . . . | . . . | . . . | . . . . | . . . . | 203 | . . . . | . . . . | . . . . | . . . . | . . . . | 21,357 |
| 25,690 | 92 | 55 | 83 | . . . | . . . . | . . . . | 100 | 133.5 | 133.7 | . . . | . . . . | . . . . | 35,741 |
| 8,560 | 101 | . . . | . . . | . . . | . . . . | . . . | 84.7 | . . . . | . . . | . . . . | . . . | . . . . | 15,950 |
| 21,180 | 165 | . . . | . . . | . . . | . . . | . . . | 128.4 | . . . . | . . . . | . . . . | . . . . | . . . . | 31,543 |
| 9,180 | 166 | . . . | . . . | . . . | . . . . | . . . . | 54.7 | . . . . | . . . . | . . . . | . . . . | . . . . | 25,560 |
| 7,140 | 57 | . . . | . . . | . . . | . . . . | . . . . | 125.3 | . . . . | . . . . | . . . | . . . . | . . . | 19,165 |
| 33,380 | 95 | 78 | . . | . . . | . . . | . . . . | 179.3 | 209.6 | . . . . | . . . . | . . . . | . . . . | 77,348 |
| 6,400 | 33 | . . . | . . . | . . . | . . . . | . . . . | 194 | . . . . | . . . | . . . . | . . . . | . . . . | 17,731 |

# LUZERNE AND CARBON COUNTIES.

## SOUTH DISTRICT.

To His Excellency HENRY M. HOYT,

*Governor of the Commonwealth of Pennsylvania:*

SIR: In accordance with the requirements of the ventilation law, I have the honor to transmit herewith my annual report of accidents, and of such other matter as is required, which have occurred in and about the mines or collieries located in the above mentioned district during the year ending December 31, 1879.

The report contains a tabular list of the fatal and non-fatal accidents in a similar manner as was given in my previous report. The causes of accidents resulting in the loss of life is explained more fully than heretofore; the reason for which can be seen by referring to the descriptive portion of the report. By enumerating the fatal and non-fatal accidents and comparing them with the preceding year, their relation to one another can readily be seen by glancing at the following table:

| | 1879. | 1878. |
|---|---|---|
| Accidents resulting in death, | 25 | 30 |
| Accidents not proving fatal, | 100 | 70 |
| Tons of coal produced, per life lost, | 166,260 | 95,553 |
| Tons of coal marketed, | 3,848,598 | 2,737,581 |
| Coal production, | 4,156,486 | 2,956,588 |
| Persons employed, | 8,750 | 8,559 |

According to the above summary it will be observed that the number of lives lost are five less than the preceding year, while the non-fatal accidents are thirty more, many of which are of a trivial character, and do not come under the head of "persons seriously injured," as contemplated by the act of Assembly.

The number of deaths from colliery accidents for the past nine years are two hundred and sixty-two—an average of nearly twenty-nine each year. Their causes are as follows: By fall of coal, roof, and sides, fifty-one per cent.; by explosions of gas, five per cent; by mine cars, thirteen per cent.; by hoisting machinery, breaking, and run over by mine cars in slopes, seven per cent.; by miscellaneous, under ground, twelve per cent.; by miscellan-

eous, above ground, twelve per cent. While the sacrifice of life, in the mines, for the past year has decreased, yet it is deplorable to have so many killed. Those happening by falls of coal are more than one half of all the other causes. By a careful observation, I am lead to conclude that the majority of the accidents by falls of coal occur for the want of better knowledge of mining on the part of the sufferers; others happen accidently, whilst some take place by inattention of those whose duty it is to care for the safety of their workmen. The improvements about the collieries during the year have been extensively carried on, as the descriptive part of the report will show.

Very respectfully submitted,

T. D. JONES,
*Inspector of Coal Mines.*

Hazleton, *January 31, 1880.*

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**Colliery Improvements.**

The improvements in and about the colleries in this district have been more extensively carried on during the year just ended than the preceding year or that of 1878, the reasons for which are obvious. During 1878, scarcely any "dead work," such as driving gangways, opening breasts, sinking slopes, &c., had been done, and all work that the individual operators could possibly get along without for the time being was discontinued, and the greatest of economy was resorted to. Now that the coal which was previously opened has become comparatively worked out, the operators find that they must re-commence to do "dead work," or lose in shipments.

It will be remembered that the shipments of coal from this district, the Lehigh region, during 1878, was a little over twenty seven per cent. less than that of 1877, while for 1879, it has increased forty and a half per cent. more than in 1878, or about two and one eighth per cent. more than in 1877.

The production of coal and the amount shipped to market for the above years is as follows:

| | Production. | Marketed. | Sold to Employees and used at Mines. | |
|---|---|---|---|---|
| | Tons 2,240 lbs. | Tons 2,240 lbs. | Tons 2,240 lbs. | Per cent. |
| 1879, | 4,156,486 | 3,848,598 | 307,888 | 8 |
| 1878, | 2,956,588 | 2,737,581 | 219,007 | 8 |
| 1877, | 4,070,012 | 3,768,530 | 301,482 | 8 |
| Total, | 11,183,086 | 10,354,709 | 828,377 | |

**Damages to Properties, Fire in Mines, Breakers Burned Down, &c.**

On the 12th of December, 1879, a fire broke out in East Sugar Loaf colliery, No. 2, located at Stockton, and operated by G. B. Linderman, Skeer, & Co. The fire originated near the pump, in the fourth lift, from the pumpman's lamp. The place was very hot, caused by the heat from the steam pipes, and, of course, the timbers were very easily ignited. The slope is down five lifts from the surface, equivalent to fourteen hundred and fifty feet, at an angle of 34°. At half past five, A. M., on the morning of the fire, the pumpman left the fourth lift-pump and went down to attend to the pump in the fifth lift, and at six o'clock the stable boss went down to feed the mules, and observed nothing unusual, but at half past six, A. M., when the second car was being lowered with the men, they smelled smoke, and informed the stable boss of the fact, who immediately went to the top to tell the mine boss. They descended the slope to where the fire was; but all efforts to extinguish it proved ineffectual, as they did not have the necessary apparatus, such as hose, &c., which they could attach to the pump, at hand, and were obliged to make an attempt by another way, which also proved futile, owing to the debris and the density of the smoke in the fourth lift, inside of the pump-house.

The superintendent, with others, got to where the fire was, and while in the act of throwing water on it, the roof began to fall and they were compelled to retreat via slope No. 5, to the surface. The next thing in order was sealing up the mouth of the slope, to check the air current, and, in the mean time, to make such changes as were deemed necessary to reverse the ventilative current; by the time this was nearly completed, Doctor Linderman appeared on the ground and requested the closing up of all places possible that in any way permitted air to enter the mine, and to discontinue making any further changes in the ventilation, fearing that if the air current was reversed, making the slope the inlet, it would prove disasterous in causing the fire to extend to the upper lifts, which were abandoned and no way to get into them. The next morning he finally made up his mind to drown slopes Nos. 1 and 2, so as to make a sure thing of it. As these two slopes are connected, it was impossible to drown No. 2 without drowning No. 1, and, as No. 1 has been partially on fire since April 7, 1875, this method of extinguishing mine fires by drowning will eventually prove a success in putting that fire out too, (if the water is left to raise high enough,) and, doubtless, it will be a source of relief to a great many to know for certainty that there is no more danger, from that fire, at least, to Hazleton property.

The pumpman emphatically denied knowing anything about the fire, but as I am credibly informed that a fire occurred there before by his lamp, (but was fortunately discovered in time, and was easily put out by throwing water with buckets on it,) it is reasonable to suppose that this fire took place the same way.

**The Cranberry Breaker, owned and operated by A. Pardee & Co.,**

Was burned down on the 17th of May, 1879. The cause of the fire is not positively known. It is said to have originated back of the boilers near the stack.

**Summit Hill Slope No. 4 Mine Fire**

Has entirely been extinguished by drowning and sealing up of the mine.

**Colliery Improvements at Jeansville Spring Mountain Collieries, operated by J. C. Haydon & Co.**

This company has sunk a new slope on the south dip of the Wharton vein, a distance of . . feet to the synclinal. The pitch varies from 35° to 10°, and the coal is of a very fair quality. The dimensions of the slope are as follows: Size of timbers, 12″×12″, yellow pine; length of collar, eleven feet six inches; spread of timbers, fourteen feet two inches; length of leg on mud sill, seven feet; center prop five feet from the side, affording a pump-way, and a single track slope. On the surface they have erected a pair of 13″×24″ second motion engines; diameter of drum, eight feet; face of drum, ten feet. The steam is generated by three new boilers, which are thirty feet long, and thirty-two inches diameter. Owing to the scarcity of fresh water for mine purposes, and to obviate the necessity of using the mine water, which the company has frequently to resort to during the dry season, they have put down three bore holes at considerable expense. The flow of water from these holes is not what might be desired, yet it adds materially to supplying the boilers with fresh water.

**Colliery Improvements at Beaver Brook, operated by Charles M. Dodson & Co., E. L. Bullock, Superintendent.**

This company has secured quite an accession to their lease, by leasing from the Lehigh and Wilkes-Barre Coal Company a portion of the adjoining tract, containing about ninety thousand tons of superior quality of Mammoth vein coal, which can be mined by stripping or uncovering the coal. The vein also extends into the land leased by the firm from C. Tower and others, and will yield about thirty-five thousand tons, together with about forty thousand tons under cover in both tracts, making in all about one hundred and sixty-five thousand tons of coal. This estimate is not based upon any speculative calculation, but upon actual data obtained from borings, and the condition of the vein as it is uncovered.

The vein in the south basin has been proved to be thirty-one feet thick, and the stripping varies from nine and a half feet to eleven feet in thickness, while in the north basin the coal is thirty-six feet thick, and the stripping eight feet. It is considered, by those who have done a great deal of such work, that it is remunerative to strip a foot of earth for a foot of coal, and the ratio, so far, holds two of coal for one of earth. The comparative cost of mining the coal by stripping, and that of the ordinary mode of mining, is from fifteen to twenty cents in favor of the former. The stripping of the coal is generally contracted, and the price paid for such work varies from twenty to thirty cents per cubic yard. The mining

of the coal is invariably done by the companies, and costs about twenty cents a ton to mine it, exclusive of the cost of shipping. To this needs to be added the various costs for mine supplies, haulage, preparation, &c., to equal the total cost per ton of coal, and as these items are not at my disposal, I cannot give them. The coal from the stripping is dropped into an old breast in the Wharton vein, underlying the Mammoth, by means of a hole sufficiently large driven through the intervening strata, which at this point was only ten feet thick. The coal is then loaded into mine cars, and hauled to the bottom of the subterranean slope, and hoisted to the countergangway, from thence to the bottom of the main slope, where it is hoisted direct into the breaker.

**Improvements at West Cross Creek Colliery, (Gowen,) operated by Cox Bros. & Co.**

This colliery was formerly operated by Lewis Rothermal, Esquire, but during the summer it changed hands, and is now leased by the above mentioned firm. Since this company has taken hold, they have been making very extensive improvements, in sinking a new slope on the Buck Mountain vein, and remodeling the breaker. The shipments of coal from this colliery have been limited during the year just ended, on account of the old workings becoming exhausted, and no improvements being made to keep up the tonnage. This tract contains, reckoning from the lower measures up, the Buck Mountain, or B veins, the Wharton, or D, the Mammoth, or E, and the Primrose, in a workable condition. The latter vein has not been very productive nor profitable. The Mammoth has been tolerable, but the coal is considerably crushed. The two latter veins have been worked by drift-workings. The Wharton vein has been worked by a drift and slope, and the coal was of a very fair quality. This slope was not sunk to the basin, and there remains a great deal of coal which will probably be worked by a tunnel, driven from the underlying vein, on which a slope has lately been sunk in very good coal. The acreage of coal lands in this tract is large, and if the coal continues to be of so good a quality as where the slope is sunk, the company will evidently be remunerated for their investments. The Buck Mountain vein, on which the new slope is sunk, has been worked to the east by two drifts. The coal in these drifts was very shaly, nevertheless it was very good for domestic purposes. The western and the greater portion of the tract has not been worked, that is the Buck Mountain vein. The slope is down two hundred and ninety-five feet, at an angle of 45°, where the gangways are turned off east and west of the slope. The coal is much better in the slope, than in the drift-workings. The lower drift has been partially re-opened, and will be driven into the adjoining tract, which has also been leased by the firm of Cox Bros. & Co., and which undoubtedly will add greatly to their shipments. By the present outlook of this colliery, it will soon compare favorably for quality of coal, capacity of production, with any in this region.

**Improvements at Highland Colliery, No. 2, operated by G. B. Markle & Co. Mine Superintendent, James C. Howells.**

The ventilation in this colliery has been inadequate and defective, in consequence of which the company has erected a sixteen foot diameter fan, run by a 12×18 inches direct acting vertical engine. The fan is situated at a right angle with the outlet, hence the air is admitted on the side of the fan, and when running at ninety revolutions a minute, it exhausted 35,586 cubic feet of air. Water gauge indicating one inch. The new outlet, effected from the face of one of the breasts to the fan, has been the means of greatly shortening the route for the air to travel, which is a very important consideration towards increasing the ventilative current. By branching off this outlet, they have been successful in driving a traveling-way to the surface for their mules to travel to and from their work, instead of hoisting and lowering them, which was only done in case a mule should get sick or hurt. The mules in this region are invariably kept in the mines, and they seem to thrive, if anything, better than when they are taken out of the mines every night. The cause for which I presume is, that they are in a constant temperature, and not subjected to sudden changes by being brought to the surface every night. In the winter season, the temperature on the surface is very often 4°, and sometime 20° below zero, (F.,) while in the mines it is nearly constant at from 50° to 60°. They have sunk a subterranean slope, a distance of —— feet from the first lift gangway to the basin. The machinery is placed in the mines, and the steam is conveyed from the surface through a four inch diameter pipe. The vein, which is the Buck Mountain, in slope No. 2, has ended in a fault, at a distance of three thousand two hundred feet west of the slope, while to the east the gangway has continued in good coal for a distance of about a mile.

**Improvements at Humboldt Colliery, operated by Linderman, Skeer & Co. William Airey, Superintendent.**

Owing to the inadequacy of ventilation in this colliery, the company have put up a fifteen foot diameter fan, run by a 14×20 inches horizontal engine, direct acting. This fan, when running at one hundred revolutions per minute, the water gauge indicating 1.7 inches, discharged 65,676 cubic feet of air a minute. The addition of this fan, causing ample ventilation to circulate through the workings, has been hailed with pleasure by the workmen, and the condition of the mines has been immensely ameliorated. On the 22d of September Mr. William Airey, superintendent, Mr. William James, mine boss, and myself, gave this fan a very fair trial, of which the following is the test:

Number of revolutions of fan, 100.

Dimensions of engines, 14″×20″.

Dimensions of outlet, 6½′×8′=52 square feet area.

Diameter of fan, 15 feet.

Width of fan, 4½ feet.

Temperature outside, 60°.

Temperature in outlet close to fan, 53°.

Barometer outside, 29 inches.

Barometer in outlet close to fan, 28.95.

Water gauge indicated 1.7 inches.

The diagram shows how the air was measured so as to get an average velocity, for it varies in different parts of the current:

Measurements taken at A=1060 feet lineal per minute.
Measurements taken at B=1280 feet lineal per minute.
Measurements taken at C=1500 feet lineal per minute.
Measurements taken at D=1540 feet lineal per minute.
Measurements taken at E=1610 feet lineal per minute.
Measurements taken at F=1800 feet lineal per minute.
Measurements taken at G=1900 feet lineal per minute.
Measurements taken at H= 780 feet lineal per minute.
Measurements taken at I= 800 feet lineal per minute.

9)11370

Average, 1263 feet lineal per minute.

Roof of air-way.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |
| G | H | I |

This multiplied by the size of the airway gives 65,676 cubic feet a minute. The friction of the anemometer, in this case, has been disregarded. The horse power in the air is equal to 17.6 nearly. The average velocity of the three measurements at each of the three stations in the airway, *i. e.*, at the roof, center, and floor, is 1280, 1650, 860, lineal, respectively. From this it will be seen that the velocity of the air was 0.288 per cent. greater in the center than at the roof of the air-passage, and 0.919 per cent. more than at the floor, and 0.329 per cent. less at the floor than at the roof. The cause for such an immense difference in the velocity between the center measurements and that of the floor was caused by the casing leading from the outlet, (which was vertical,) to the fan, being at an angle of 60 degrees from a perpendicular. This abrupt angle could and should have been avoided by driving the outlet to the surface on the pitch of the vein instead of jumping up perpendicularly when nearing the outcrop. All angles possible should be obviated in connection with the ventilation of mines. This fan is very substantially built, and can be run up to one hundred and fifty revolutions a minute with safety, if necessary. It is much preferable, in my opinion, to have fans run by horizontal engines to that of vertical. The objections to the latter being (1) that the knocking on the up stroke cannot be taken out of them. (2) That the same speed, when running a fan cannot be got out of them as can be from the horizontal. (3) That the wastage in oil is a great deal more. (4) They are always dirty by the oil running down from the guides on to the cylinder, and by the oil splashing from the crank. The latter, if nothing else, is sufficient cause to prefer the horizontal engine.

### Improvements at Room Run, or No. 3 Colliery,

Operated by the Lehigh Coal and Navigation Company. Joseph S. Harris, superintendent and engineer. W. D. Zehener, division superintendent. Richard Eustice, assistant superintendent.

Since writing my last report, giving a description of the explosion of gas in the west fifty foot gangway, a great change has been wrought in the ventilation, by enlarging and the re-timbering of nearly the whole length of the return air-way, at a cost of about four thousand dollars, and a large eighteen foot diameter fan, costing about twelve hundred dollars, has been erected to take the place of the old one. When I last inspected this colliery, October 15, 1879, I measured near the face of the gangway, nine thousand one hundred and thirty-nine cubic feet of air a minute for fourteen men. This practically shows that they have gained about fifty per cent. increase quantity of air at the face of the west fifty foot gangway by the change. The condition of this part of the work was very gratifying to me at the time, and the men told me they were well satisfied since the improvements had been made.

**Colliery Improvements at Cranberry. Operated by A. Pardee & Co. C. Pardee, Superintendent.**

This colliery has sustained a serious loss by the breaker burning down, May 17, 1879. The cause of the fire is not positively known, but supposed to be the work of an incendiary. A new and commodious breaker has been built on a new site in line of the slope, whereby they will be able to hoist the coal direct into the breaker, instead of hauling it over the long trestling to the old breaker, which they were obliged to do heretofore. The new breaker contains all the modern devices for the preparation of coal, such as D. Clark & Co.'s patented jigs, patented breaker rolls, &c., and will be able to prepare about five hundred tons of marketable coal per day. Through Mr. C. Pardee's personal supervision, the machinery has been very satisfactorily fenced off for the protection of both men and boys. In the mines they have built a counter chute, to convey the coal from the Cranberry mines to that of the Crystal Ridge colliery, which is a lift below. This was done with the intention of keeping all the men possible at work, during the building of the new breaker, together with the view of opening new works, such as driving gangways in the Wharton vein, and the driving of another tunnel on the south side of the basin to the Wharton seam. This tunnel is seven feet high, nine feet wide, and will be about four hundred feet long. A subterranean slope has been sunk, called the West Cranberry, which is a single track slope, and is sunk to the basin a distance of two hundred and thirty feet from the upper gangway, pitching 27°, 20°, and 7° respectively. The hoisting machinery is placed on the surface, and the hoisting rope is extended down through an old breast, which was driven from the upper gangways. Taking everything into consideration, this colliery is in a very fair way of yielding a large production of coal for many years to come.

**Improvements at Crystal Ridge Colliery, No. 6, operated by the same company.**

This is a new slope, sunk on the north dip of the Mammoth vein, the dimensions of which are as follows: Collar in the clear, twenty feet; spread, twenty-four feet; length of leg on mud-sill, eight feet, with two center

props; size of timbers, twelve by twelve inches; batter given to legs, three inches per foot. This affords a double track slope and a pumpway. The length of the slope is three hundred and eighty-seven feet, from the surface to the synclinal axis, and varies in pitch from 29° at top, to 3° at bottom of slope. The mode of ventilation, at present, is produced by the steam exhaust from the pump, and meets the requirements, but if it should become inadequate as the workings are opened out, a fan will be erected to supersede it.

The coal is equal to that in the main basin, which was always considered the very best for steam and domestic purposes. This slope is sunk on the local basin, south of the Hazleton basin, a continuation of the basin on which old Crystal Ridge, No. 1, was sunk, that has been abandoned for many years. A new breaker, containing about two hundred and seventy-five thousand feet of lumber, has been built, to prepare the coal for market produced from this slope.

#### Improvements at Sugar Loaf Colliery, operated by the same company.

A sixteen foot diameter fan, direct acting, driven by a 12 by 18 inch vertical engine, has been erected at this slope to ventilate the Wharton vein workings. The Mammoth vein is ventilated by the same sized fan, which is located at South Sugar Loaf colliery, on the south side of the Hazleton basin. The former fan is capable of producing forty-two thousand cubic feet of air a minute when running at ninety revolutions, the water gauge indicating 1.5 inches. The vein is unusually contracted at this colliery, and the coal is very hard, requiring an extraordinary amount of blasting. This fan will certainly keep the working-places in a healthy condition, and there ought not to be any complaints of "bad air," if it is properly distributed. The number of men and boys employed in this mine does not exceed seventy-five, including those working night-shifts.

#### Improvements at Pond Creek Colliery.

This colliery has lately been opened by the Pond Creek Coal Company, limited, and is located near the extreme eastern end of the Green Mountain coal basin. It is bounded on the east by White Haven, on the west by the town of Upper Lehigh, and on the south by the Sandy Run colliery.

The slope is sunk on the south dip of the Buck Mountain vein to the local synclinal axis, a distance of one hundred and eighty-four feet. The main basin is more to the south, and they are now driving two gangways to get around the eastern and western points of the anticlinal, which intervenes between the north and south outcrops. They have driven sufficient gangways to afford the opening of about twenty breasts, and by the time the breaker is ready, there will be room for nearly as many more. Two air-ways have been driven from the gangway to the surface for ventilation, one on each side of the slope. Preparations are in progress for the grading of the slope, driving of turnouts or sidings, making room for sump, pump-house, and the laying of the tracks at the bottom of the slope. The

tracks at the bottom of the slope will be put down in such a manner, as to cause the cars to work automatically. The laying of the roads at the bottom of the slope is a very important consideration, and when properly "put in," it saves in many cases two or three men and a mule, which is quite an item of expense in course of time. Lately, many changes to effect this plan have taken place in this district, and not only the saving of the men and mules is accomplished, but the facilities for getting fully ten per cent. more coal up the slope is attained.

The breaker will be built and ready for work by the latter part of February or the middle of March, and will contain about one hundred and sixty thousand feet of lumber. Its capacity is estimated to be five hundred tons of coal per day. They have a large quantity of "stock coal" on hand ready for shipment, the result of opening a large amount of work. Ten blocks of miner's houses have been erected, and the company contemplate building more. With the present indications, this locality bids fair to become a neat little mining town.

**Accidents, in detail, by Explosions of Carbureted Hydrogen Gas.**

Accident No. 3.—Michael Mullen, aged twenty-three, was fatally burned by an explosion of gas in shaft No. 1, Room Run mines, February 7, 1879. The deceased was laboring for a miner in driving the air-way, and was at work driving the cross hole from the gangway to the air-way, and had just holed through into the air-way. The miner had loaded a car, and the laborer had gone to look for the driver. Was away perhaps twenty minutes. When he returned he went to go up the cross hole, when the gas ignited from his naked light, and set fire to a keg of powder, which was placed on top of the gangway timbers. I believe this is what did the damage, for there could not have been a great quantity of gas there. As the mine boss had been in the mines the night before to see that the connection was properly made, and to clear a little standing gas, which was in a proving hole in the face of the gangway; and after arranging the air current, he went home, and the next morning he sent his assistant to see if there was any gas there, and there was none. (The miner said he had tried it himself, and found none.) After they had worked till noon, the explosion occurred. My theory is that as the air current was partially cut off, there was not sufficient air circulating through the proving hole to keep it clear, and the gas re-accumulated and came down on his light. This vein had newly been cut by a tunnel, employing, at the time, about six men.

Accident No. 19.—James Ead, driver, aged nineteen years, was fatally injured, by an explosion of gas, in Room Run shaft, No. 1, east gangway, on the morning of October 28, from which he died on the night of the 29th. The cause of the happening is as follows: The men—a miner and two laborers—were employed at making a turnout, or siding, at a point in the gangway opposite where a balance plane was being made to let the cars of coal from an upper lift down to the gangway where they were working. The deceased not having much work to do at the time, concluded to assist

the men. He began to saw off the fore poles projecting below the collar, opposite an abandoned chute, when the miner told him to desist, but he continued sawing, evidently anxious to do a good turn for the miner, when the gas, which had accumulated in the chute, due to stopping the ventilating fan during the night previous, owing to scarcity of water to generate steam, ignited from his light, throwing him down, and, as I supposed, he fell across the "horse," which is kept to form a platform by throwing planks across it, receiving internal injuries, from which he died quite unexpectedly. The two laborers and the deceased walked home after the occurrence, a distance of about a mile, and little was thought of their burns from the explosion. It is true that the deceased had no business there, nevertheless the gas was just as apt to be ignited from any of the other men's lights as from his, for they were not aware there was any explosive gas in the chute, having frequently been up it, and found none. "Of course they took it for granted there was none there the morning it exploded." The bosses, whose business it was, had not examined the place in the morning, and the only inexcusable argument they gave that as there was no one working in this gangway except the three men at the turnout, and the driver, they gave the entire charge to the miner. On the 15th of October I had been at the scene where the explosion took place, and was well satisfied as to the condition of that part of the workings. There were eleven thousand cubic feet of pure air per minute circulating on the gangway opposite where the explosion occurred.

**Accidents by Falls of Coal—Roof and Sides.**

ACCIDENT No. 5.—Thomas Commiskey, miner, aged fifty-five, working at robbing the big vein in Jeanesville, No. 5, was fatally injured by a fall of coal on the 14th of March, and died on the 20th of the same month. He and his partner were filling the last car, but not having sufficient coal to finish the car, the deceased went to the face to bar a little coal down, but more came down than he expected, and he could not get out of the way in time, ere a lump of coal caught him, and broke his leg, and injured him otherwise. He had been mining at Jeanesville for thirty years.

ACCIDENT No. 8.—Thomas Smith, miner, aged twenty-seven, working at robbing a pillar in the Wharton vein, was fatally injured at Beaver Brook, No. 4, April 22, and died in the hospital, (St. Luke's,) on the 17th of May, a little over three weeks after the a cident. He had fired a shot in the pillar, but owing to a prop that was stood in the breast, the coal did not fall, and he went on the lower side of it to knock it out, and the coal it supported fell on him, breaking his leg and fracturing the skull in a shocking manner.

ACCIDENT No. 9.—Robert Norris, aged fifty-two, was instantly killed by the coal rushing through the battery and catching him in the chute, at Spring Mountain colliery, No. 4, located at Jeanesville, April 24, 1879. The deceased, with two laborers, was drawing out loose coal from his breast, preparatory to abandonment of that portion of the workings, *i. e.*, the ex-

tremity of the west gangway. At the time of the accident, Norris, with one of his laborers, was at the battery platform, (if a battery it could be called,) breaking a piece of slate with a wedge and hammer. The wedge fell down the chute, and Norris went after it, and while in the act of returning up the chute to the platform, the coal in the breast started and rushed down the chute, completely covering him, and doubling him around a stick that was thrown across the chute, that it was with difficulty that he was extricated. From the appearance of the scene of the accident, and from what information I obtained at the examination, I must pronounce this accident to be sheer recklessness in not fixing the battery, after being told by so many of the danger. The deceased and myself used to be on very intimate terms, and the day preceding the occurrence I had a talk with him, when he said that he was getting along first-rate, and that he had done well in drawing out his loose coal, and would finish his place before a great while. We had frequently discussed the inspectors' annual reports, and he was of the opinion the inspectors were not justifiable in censuring the miners for recklessness in case of accidents; tha the miner had to run great risks sometimes. I fully agreed with him there was great danger attending to mining, but it was not where the most danger existed that the accidents were the most frequent, but that it was to the contrary; and after producing figures to show where the most accidents took place, he was astonished. I least suspected the deceased to be so careless as to expose himself to so much unnecessary danger, where a temporary battery could have been put up in about half a day, which would, in all probability, obviate the calamity. I merely give this incident to show that it is not the inspectors' wish to censure the undeserved, but it is with the intention of blaming those who are blameable, and, also, with the object of doing good. I herewith produce the information elicited at the examination, which will explain itself.

Examination of the causes of the death of Robert Norris, who was killed at Spring Mountain colliery, No. 4, April 24, 1879, by the inspector of mines.

William Hughes, *affirmed:*

I am a miner. I advised the deceased to fix his battery, as I thought it unsafe for him. I told him I would not work there, and where I would not work myself, I would not ask my laborer to work. I don't think there is anybody to blame but himself.

John Duffy, *affirmed:*

I am laboring for Norris. I worked for him two months. I was afraid that when the battery would start, that I would be caught. When the other laborer called me, I was down on the gangway. I don't think there is any one to blame about the accident but himself.

John D. Conoghan, *affirmed:*

I only worked with him one and one half days before the accident at the battery. I wanted him to fix the platform better, so that we could run away when we would start the coal in the breast. He said yes. The wedge

dropped into the chute, and Robert went after it, and when coming up, the coal started from the breast, and caught him in chute, killing him instantly. I don't think there is any one to blame.

DAVID MCFARLANE, mine boss, *affirmed:*

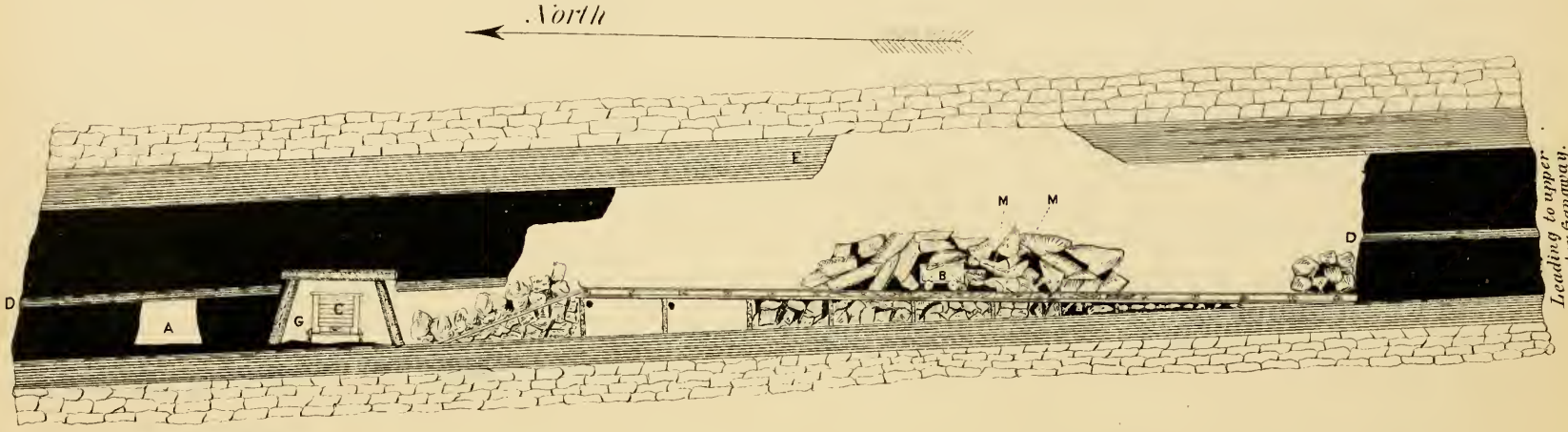
On Tuesday, I was with him at the battery, and assisted him to work in starting the battery, and I remonstrated with him for not fixing his place, and he promised me he would do so the next day, but he did not come to work the next day. I requested him to fix the place different times, and he promised each time to do it.

ACCIDENT No. 10.—Daniel Coyle, miner, age thirty-two, was instantly killed by a fall of roof, (clod,) at Harleigh colliery, No. 1, June 6, 1879. The deceased, and his partner were at work at robbing a pillar, and had taken a cut out of it about seven yards wide, and when loading the last car of coal, two large flags of slate or clod fell from the roof, and lit on the front end of the car where Coyle was standing, and completely demolishing the car, and crushing him to death. The driver, who was standing a short distance back of the car, noticed something drop from the top, and called their attention to it. The deceased's partner said, that as small pieces frequently fell they did not think any thing of it. Thus, it will be seen that they ought to have obeyed the warning given them to get out of the way. The deceased and his partner had only changed positions a little while previous to the accident, on account of the awkwardness caused to the latter in shoveling.

ACCIDENT No. 11.—George Hutchinson, miner, aged forty-seven, was fatally injured by a fall of coal at East Sugar Loaf colliery, No. 5, July 8, 1879. The statement of the mine boss was that he had been up the breast on the 3d of July, and told Hutchinson and his partner to go home, as the place was working, and they did so. On the 6th he again visited them, and requested them to be careful, but the top coal was not working near so bad, and lastly I visited them on the morning of the accident, and told them the place was working, *i. e.* crushing, and for them to keep down. This is all I know about it. John Airey, mine boss.

STATEMENT OF THE DECEASED'S PARTNER.—The boss told us to keep down, as the top coal was working. This was the day of the accident. We did not blast any for the last two weeks. We worked together two years. Hutchinson was hard of hearing, and I told him he ought to work some where else besides in the mines, and he said he would work no where else. We were on our way home after finishing our day's work, when the driver came in and told us he would give us two cars if we would load them; so we consented. I stopped at the platform to load the laborer, and Hutchinson went up the breast, and when he got up I heard something falling. I looked up and saw his light fly. I hurried up to him and he said he was struck.

THE INSPECTOR'S VIEWS.—From the indications of the place, it appeared as though it had been crushing very badly for some time. It is evident




REFERENCE

A - *Airway*
B - *Buggy*
C - *Mine Car*
D - *Dividing Slate*
E - *Clod*
G - *Gangway*
MM - *Men*

*Scale, 20 ft. to an inch.*

*Sketch showing how Patk McCole. and James Gallegher were killed while pushing a Buggy of Coal from the face of their Breast to the Platform on the Gangway at Highland Colliery, No. 2. July 15. 1879 Operated by C.B. Markle & Co.*

*T. D. Jones.*

that the officers of the company had an object in view, and that was to keep up the top coal, that is the six foot bench, so as not to bring on a crush on the main gangway, and also with the intention of getting as much coal as possible from the old working. The vein at this point doubled itself, so that one breast was worked over the other, and this accounts for the crush on the top coal in the under breast. The lump of coal that fell was from the six foot, and, doubtless, was on the eve of falling when the deceased was going up the breast, and when it did fall, it rolled down the breast against him, breaking his two legs and one of his arms. He died shortly after he was taken home.

Accidents Nos. 12 and 13.—Patrick McCole and James Gallagher, both miners, ages twenty-four and thirty-five, respectively. The former was instantly killed, and the latter fatally injured by a fall of roof (clod) at Highland, No. 2, July 15, 1879. These two men were working a breast in the Buck mountain vein, and when pushing a buggy of coal from the face to the car, the fall took place. The fall happened at a distance of forty-four feet from the gangway, or fifty-six feet from the face of the breast, where it was twenty-five feet wide. The roof in this mine is very dangerous and treacherous, as it is of clod (shale) for a great thickness, and requires careful watching on the part of the men and bosses. Edward McGettrick stated that he had been talking to them about twenty minutes before the accident, and they told him that the place was dropping, *i. e.*, pieces falling from the roof. Notwithstanding the warning, they went on working. The mine boss said he had been up their breast the morning before the accident, and inquired of them how the top was, and they said that it was all right. Another man, whose name was John Gallagher, had been with them "cracking jokes" only ten minutes before the occurrence, and did not observe anything unusual. I am of the opinion that the place should have been adequately center-propped, and as the men were allowed seventy-five cents for every prop they would stand, it was the mine bosses duty to exact them to do it or else stop them from working. But it is the old, old story, "it's like an anvil," or "I never thought it could fall," or some such expression. Whenever I enter a man's breast or chamber, and exact upon the place being center-propped for his safety, the person working there invariably is the first to oppose me, saying "it don't need it, the top is good," or, "I could sleep here for that matter," when it should be otherwise, so long as they are paid for securing the place. But it is a fact worthy of note, that there are men (called miners) in this colliery that don't know how to stand a center-prop rightly, and would rather work in danger than stand a few center-props to secure themselves. I have given the mine boss positive orders that so long as the roof continued to be of so treacherous a character there must be two rows of props stood in the breast. To give an idea how the accident occurred, I made a sketch of the scene of the accident, which accompanies this report, to enable persons unacquainted with mining to comprehend the situation. It will be observed that if the parties had

extended the props supporting the buggy road to the roof, instead of cutting them off, it would have offered some support to the roof, and by doing the same thing under the opposite rail, it would have been sufficient in my estimation to prevent the calamity.

ACCIDENT No. 14.—Patrick McCole, miner, aged twenty-four, was instantly killed by a fall of coal, at Ebervale, No. 2, July 30, 1879. The deceased was at work at the time with his partner, shoveling back some coal from the face of his breast, when about a ton of the "benches" fell on him while in a stooping posture, completely severing his head from his body, which had to be brought out of the mines in a powder keg. The cause of the happening was owing to some loose coal having been left hanging, which they had previously (about five days) put a shot in. As the hole failed to do its execution, they went on working on the face without even attempting to "sound it," and regardless of the danger. The prevailing excuse was, that "they could not reach it," while I contended that if they had reserved coal enough under their feet instead of loading it all out as fast as they mined it, they could reach it, and have made the top coal (benches) secured. The breast was flat, and about twenty-seven feet wide. The vein is the Mammoth, and about twenty-eight feet thick. Only the four feet, two feet, seven feet, and the benches are worked while driving up the breast, leaving the six foot for a top, which affords a very good roof. There is a great deal of clod over the six foot, hence it is of the utmost importance to leave the latter bench up for safety.

ACCIDENT No. 15—Owen Boyle, age sixty, was instantly killed by a fall of roof, at Spring Brook colliery, No. 5, August 1. The deceased was laboring for a miner in a breast, and while loading the car the fall took place, resulting to the deceased as stated, and seriously injuring the miner. The breast had been driven up from the gangway for a considerable distance, but owing to the roof being of a dangerous character, it was discontinued until the face of the breast could be entered by a counter gangway. At the time of the occurrence, they were loading the car on the counter road, at a point of about seven yards from the face of the breast. Had they kept the road close up to the face of the discontinued breast, instead of laying it at the point above mentioned, and not to have taken such a big cut (eight yards,) of the pillar, the accident might possibly have been avoided. It is entirely wrong to cut out of a pillar, in going through it, more than will just admit of room enough for the car, (with about three feet on each side,) to go through it, for the coal that is left at the time, can all be got when working back. The breast produced a great deal of water from the roof, which is a sure sign of danger if there exists any "clod," for it is apt to fall without giving any warning, owing to the water running through the crevices, *i. e.* between the rock and the slate, loosening it.

ACCIDENT No. 16.—Michael Houston, miner, aged thirty-five, was fatally injured by a fall of coal, at Council Ridge colliery, August 27. The deceased was working a breast, and was caught by the coal falling on him,

caused by two unobserved slips coming together, something similar in shape to that of a triangle. A great many of the accidents in the Buck Mountain vein are caused by these invisible slips, and the only preventive, in my opinion, is for the miner to advance on the upper bench first. As the vein consists of only two benches, the six and nine-foot, with a dividing slate of about eighteen inches, it can be mined with apparent safety. I have advocated this method of working this vein from time to time, and the *bosses* have *attempted* to carry it out, but as the mining of the six-foot (bottom bench) first is less laborious, and requires less blasting, they would rather endanger themselves than to do it. He died in about a week after the accident.

Accident No. 17.—John Malkames, miner, aged forty-eight, working at Laurel Hill colliery, old lift, had his thigh and ankle broken, and probably injured otherwise, by a fall of coal, September 27, and died from the effects October 3. He had fired a blast in the four-foot bench of coal about half an hour before quitting time, and, anxious to see the execution, he returned, and commenced to bar down the loose coal, when a piece of coal from top of the four-foot slate slid down and caught him. His injuries at the time were not considered dangerous, but being old, it likely hastened his death. This colliery has been exceedingly fortunate regarding personal accidents. This is the first that has occurred during a period of five years, and in that time they have mined about eight hundred thousand tons of coal, allowing one year in the five for lost time due to suspensions, &c. This is a complimentary showing, and the officers of the company are commendable for their careful watching over their operatives.

Accident No. 20.—Heinrich Reifner, was instantly killed by a fall of coal, at Highland No, 2, November 3. The deceased was put to work to enlarge the safety hole, driven in the pillar at the bottom of the slope, so as to afford sufficient room to put a warming stove in it for the comfort of the bottom men. He had prepared room for a set of timbers, and had one leg up, when a lump of coal fell on him, breaking his neck This is one of those pure accidental cases that cannot be attributed to the neglect on the part of any one.

Accident No. 21.—Joseph Boyle, was fatally injured by a fall of coal, at Cross Creek No. 1, November 15, and died December 7. The deceased for the first time, and the first shift too, had taken charge of one of these shifts, in driving the east gangway in the underground slope, called No. 5. He had drilled and fired several holes on the upper side of the gangway, but as they proved of little use, he commenced another, when a lump of coal slid out of the gangway on top of him, with the above result.

Accident No. 23.—Francis Daugherty, age twenty-three, fatally injured at Latimer slope, No. 3, December 1, and died in the hospital December 4. The deceased had left the outside man-way of the breast become blocked by letting too much loose coal down while driving up the breast, and driving a cross-cut through the outside pillar. The outside man-way is seldom

traveled by the miner, unless he is compelled to by necessity, as this case will show. On the morning of the accident he was ascending the man-way to start the coal that was blocked, and when he was up part way the coal came tumbling down and caught him. Now, I contend if the man-way was traveled oftener, and the coal, that must of necessity be let down this man-way, be broken to smaller sizes, there need be no accidents from this source. However, casualties from this cause are few, and the only remedy to obviate such lies in the men themselves, to exercise the above precaution. It was a very hazardous undertaking to start this coal, and the attempt, which proved so unfortunate, should not have been made, by any means, without his partner being there to assist him. The breast was pitching about forty-five degrees, with a man-way on each side, and was up from the gangway about one hundred and sixty feet.

ACCIDENT No. 25.—John Boltz, miner, aged forty, working at Cross Creek colliery, No. 2, was fatally injured by a fall of coal while loading a car, December 20, and died the following day. The deceased was commencing to open a breast close to the face of the gangway, which had been discontinued owing to the coal pinching out. He had two holes drilled, and ready to fire, but deferred doing so till he had loaded the car. As he was working by himself, it is impossible to tell what his intentions were, but the indications would lead me to conclude that he intended to fall the loose coal, by firing the two holes, after he had finished loading the car, but unfortunately, as it is often the case, the coal fell before he could accomplish his purpose. To prevent such accident as this, there is no one, in my opinion, who can lessen them but the person doing the work. The breast he was working in previously was very dangerous owing to the roof being exceedingly bad, and shortly after commencing a new breast, where I considered it unusually safe, he received such injuries as to cause his death the next day.

**Accidents in Slopes.**

ACCIDENT No. 2.—John Wiloughby, age seventeen, was killed by the breaking of the shackle connecting the hoisting-rope to the chain, at Harleigh slope, No. 4, January 15, 1879. The breaking of the shackle was attributed to the rope freezing fast to the sheaves on the apex of the slope. The deceased was employed, one of three, at sinking a rock slope from the Mammoth vein to the Wharton vein. At three forty, A. M., of the above date, the shift rode up the slope to the surface to take supper, and at four thirty, A. M., they went to go down the slope. The *sinker*, on which they rode up the slope, was left standing at the mouth or entrance of the slope on the pitch, during the time they were eating supper. When they were ready to go down, the deceased gave the signal to the engineer (in the meantime he got on the hind end of the sinker, and his brother inside, while the miner stood along side waiting for it to start,) to slack down, and after he had given about ten feet of slack rope, and not finding the sinker taking the slack, he immediately reversed his engine, but not in time to take up the slack, as the sinker started, taking up the slack, and

breaking the shackle. When the sinker started, the deceased fell back off the bumper of the car, and rolled to the bottom after the wreck, where he was found with his neck broken. His brother, who was in the car or sinker, was thrown out about midway in the slope, was scarcely any the worse, except that he was considerably bruised. An inquest was held by Esquire Roberts, and the jury rendered a verdict of accidental death. The diameter of the shackle iron was $\frac{3}{4}\frac{1}{2}$ inch, and the diameter of the hoisting rope one inch. Pitch of slope, 45°. Distance from drum to where the shackle stood, seventy-five feet.

Accident No. 7.—James James, age thirty-five, was instantly killed by a runaway car on the slope, at Beaver Brook slope, No. 2, April 15, 1879. The deceased had been home to supper, after working the day-shift, and was on his way back to work a night-shift, and had got to the bottom of the slope, where he remained for a short time waiting for a ride in with the driver, and when crossing the slope, from the east to the west side, the runaway car struck him, and carried him down from the counter-gangway to the bottom lift, a distance of two hundred feet. His body was shockingly mutilated, so much so that he was beyond recognition. On the 24th of March, preceding the accident, I had visited this colliery, and requested the superintendent to strictly forbid his men to travel the slope, but to exact from them traveling to and from their work via a commodious traveling-way, which had been made for that purpose, and moreover to prevent them from traveling the slope, a door and lock had been put on the column pipe-way, and a notice posted in a conspicuous place, by order of the inspector, cautioning all persons against traveling the slope. Notwithstanding the warning, some of the men would sneak down the slope, so as to get a ride in with the driver. This was the only excuse given by many of the witnesses on the inquest. The cause of the accident was the breaking of the clevis of the hoisting-rope, letting the car down the slope. The iron of which the clevis was made was evidently of a very inferior quality, as it was very much crystalized, and many other defects found in it.

An inquest was held by the coroner, Mr. Henry Banks, and the jury rendered a verdict of an accidental death.

#### By Mine Cars.

Accident No. 18.—Michael Conlin, driver, age eighteen, was fatally injured, at Lattimer colliery, October 13. The deceased was bringing a trip of cars to the turnout at bottom of slope, and while in the act of reaching to uncouple the front car the second one jumped the track, caused by a sliver or splinter of the T rail, next to the gutter, and caught his head between the bumpers or tail gate of the car. His injuries, at the time, were not deemed fatal, but as the skull was fractured it caused death shortly after he was taken home.

Accident No. 24.—William H. Thomas, mine boss, age fifty-three, had his leg broken and injured otherwise by a mine car, at Oak Dale slope No.

2, December 5, and died December 10. The deceased had crossed the track near the bottom of the slope, to his tool box, when a car passed him, (from the plane towards the bottom of the slope,) and thinking it was all right he stepped on the track, when another car came along and ran over him, with the above results.

**Miscellaneous Above Ground.**

ACCIDENT No. 1.—Andrew Hatach, aged forty, was instantly killed while in the act of putting a belt on a pulley when it was in motion, at Cross Creek colliery, No. 2, January 6, 1879. The deceased was assisting the breaker boss, and while reaching through another belt that was running parallel with the one that was off, he lost his balance when it was thrown on, and fell on the belt that was in motion, and was crushed between the belt and the pulley. His arm was terribly lacerated, and his head and body was frightfully mangled by being revolved by the pulley and dashed against the side of the breaker. This was a very hazardous undertaking for a man to attempt to lean through a belt in motion so as to put another one on, and should not have been done. Since the above accident, instructions were given to stop the machinery in order to adjust the belts, and when ready to put it on, the engine to be started slowly; with this precaution, there need be no accidents from this source. After the completion of this breaker, I made a special visit to see if the necessary protection was put around the machinery, and was satisfied that every thing was as secure then as it could be made. Vide report of 1878 on this point.

ACCIDENT No. 4.—John Fox, aged thirty-two; occupation, charge of breaker machinery; was killed by being caught by a revolving shaft, at Cross Creek breaker, No. 1, February 15, 1879. It is supposed that the deceased was putting a pulley belt on and somehow came in contact with the shaft and was whirled around for about two minutes at the rate of one hundred and thirty-five revolutions a minute before any one took notice of him, and by this time he was so horribly lacerated that he fell from the shaft. He was not obliged to go to the belt the way he did. The proper way for him was to go around on the plank walk, made for the purpose, but being of a very active turn of mind he went through a very intricate hole, not at all calculated for any one to go through. The breaker boss, and many others, testified that he was very venturesome, and he had repeatedly warned him of his dangerous practice of going by way of short cuts. I requested the parties in charge to stop the breaker or machinery until the belt was readjusted. This order was also given by Messrs. Coxe & Co., owners.

ACCIDENT No. 6.—Charles Casper, boy, aged fifteen, was fatally injured at Ebervale breaker, No. 2, April 7, 1879, and died shortly after he was taken home. The boy was employed at loading the slate at the breaker, and had gone to the slate bank with the driver; and when they were coming in from the bank with the empty car, it jumped the track on the trestling leading from the breaker to the bank, and the boy, mule, and car, were

precipitated over the side of the trestling, a depth of twenty feet, killing the mule, and resulting in the death of the boy. The track was not in the best of condition, and the driver coming in faster than he ought to have done, evidently was the cause of the accident.

Accident No. 22.—Patrick Haughey, aged eighteen, was instantly killed on breaker No. 5, operated by the Lehigh Coal and Navigation Company, at Lansford, in the Panther Creek valley, November 20, 1879. The deceased was working on the upper or first platform, and the chute conveying the coal from the first platform to the rolls became blocked, and he went down to the second platform to start it, and failing to do so at the said place he went still further down, and crawled under the second platform to where the rolls were, and (with the aid of a large bar of iron about four and a half feet long by two inches in diameter) it is supposed that he attempted to start the coal by reaching over the rollers, and while in the act of poking the bar up the chute, the same came in contact with the rollers and pulled him through, or that he lost his balance and fell in. No one knew of his going there until found on the hopper under the rollers. On the 20th of the previous month I had been through the breaker and ordered everything, in my opinion, that where the least suspicion of danger existed to be secured, and at the time of the investigation of this accident I found it had been done. I consider this unfortunate casualty purely accidental, and evidently the man ought to have known better than to dare go in proximity to the rollers when in motion.

**TABLE No. 1.**—*List of accidents proving fatal in the South District of*

| DATE. | Number of accident. | Location of Collieries. | Names of Persons Killed or Fatally Injured. | Occupation. | Age. | Widow. | Orphans. |
|---|---|---|---|---|---|---|---|
| Jan. 5 | 1 | Cross Creek, No. 2, | Andrew Hatach, | Screen boss, | 40 | | |
| 15 | 2 | Harleigh, No. 4, | John Wiloughby, | Laborer, | 17 | | |
| Feb. 7 | 3 | Room Run shaft, | Michael Mullen, | Laborer, | 23 | | |
| 15 | 4 | Cross Creek breaker, | John Fox, | Screen boss, | 32 | | |
| Mar. 14 | 5 | Spring Mountain, | Thomas Commiskey, | Miner, | 55 | | 3 |
| April 7 | 6 | Ebervale breaker, | Charles Casper, | Loading slate, | 15 | | |
| 15 | 7 | Beaver Brook, No. 2, | James James, | Miner, | 35 | 1 | 5 |
| 22 | 8 | Beaver Brook, No. 4, | Thomas Smith, | Miner, | 27 | 1 | 2 |
| 24 | 9 | Spring Mountain, No. 4, | Robert Norris, | Miner, | 52 | 1 | 4 |
| June 6 | 10 | Harleigh, No. 1, | Daniel Coyle, | Miner, | 32 | 1 | 2 |
| July 8 | 11 | East Sugar Loaf, No. 5, | George Hutchinson, | Miner, | 47 | 1 | |
| 15 | 12 | Highland, No. 2, | Patrick McCole, | Miner, | 24 | 1 | |
| 15 | 13 | Highland, No. 2, | James Gallagher, | Miner, | 35 | 1 | 2 |
| 30 | 14 | Ebervale, No. 2, | Patrick McCole, | Miner, | 24 | 1 | |
| Aug. 1 | 15 | Yorktown, No. 5, | Owen Boyle, | Laborer, | 60 | 1 | 1 |
| 27 | 16 | Eckley, Council Ridge, No. 2, | Michael Houston, | Miner, | 35 | 1 | 2 |
| Sept. 27 | 17 | Laurel Hill, (old lift,) | John Malkames, | Miner, | 48 | 1 | 3 |
| Oct. 13 | 18 | Lattimer, No. 1, | Michael Coulin, | Driver, | 18 | | |
| 28 | 19 | Room Run shaft, | James Ead, | Driver, | 19 | | |
| Nov. 4 | 20 | Highland, No. 2, | Henry Reiffner, | Roadman, | 52 | 1 | 4 |
| 15 | 21 | Cross Creek, No. 1, | Joseph Boyle, | Miner, | 24 | | |
| 20 | 22 | Panther Creek, No. 5, | Patrick Haughey, | Breakerman, | 48 | 1 | 2 |
| Dec. 1 | 23 | Lattimer, No. 2, | Frank Daugherty, | Miner, | 23 | | |
| 5 | 24 | Oak Dale, No. 2, | William H. Thomas, | Mine boss, | 53 | 1 | 6 |
| 20 | 25 | Cross Creek, No. 2, | John Boltz, | Miner, | 40 | 1 | 5 |
| | | Totals, | | | | 15 | 41 |

Killed, . . . . . 12
Fatally injured, . . . . . 13
25

*Luzerne and Carbon counties, during the year ending December 31, 1879.*

| Nature and Causes of Accidents. | NUMBER OF DEATHS. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Explosions of CH4 gas. | Falls of coal, roof, and sides. | In slopes. | Explosion of blasting powder. | By mine cars. | Miscellaneous underground. | Miscellaneous above ground. | Total. |
| Killed by assisting to put a belt on a pulley while the machinery was in motion, | | | | | | | 1 | 1 |
| Killed by the breaking of the shackle of the hoisting rope, | | | 1 | | | | | 1 |
| Fatally burned by an explosion of gas, and a keg of powder that ignited, | 1 | | | | | | | 1 |
| Killed while examining the breaker machinery. He came in contact with a revolving shaft, | | | | | | | 1 | 1 |
| Fatally injured by a fall of coal, from which he died on the 20th, following, | | 1 | | | | | | 1 |
| Fatally injured by the slate car jumping the track, and falling over the trestling, | | | | | | | 1 | 1 |
| Killed by a car running back on the slope, caused by the clevis of the hoisting-rope breaking, | | | 1 | | | | | 1 |
| Fatally injured by a fall of coal off the pillar. Died May 17, in the hospital, | | 1 | | | | | | 1 |
| Killed by the coal rushing out of the battery on top of him, | | 1 | | | | | | 1 |
| Killed by a fall of roof, while robbing a pillar, | | 1 | | | | | | 1 |
| Fatally injured by a fall of coal in the breast, | | 1 | | | | | | 1 |
| Killed by a fall of roof, while pushing a buggy of coal from the breast to the gangway, | | 1 | | | | | | 1 |
| Killed by a fall of roof, while pushing a buggy of coal from the breast to the gangway, | | 1 | | | | | | 1 |
| Killed by a fall of coal in the breast or chamber, | | 1 | | | | | | 1 |
| Killed by a fall of roof in the breast or chamber, | | 1 | | | | | | 1 |
| Fatally injured by a fall of coal. Died on the 4th of December, | | 1 | | | | | | 1 |
| Fatally injured by a fall of coal in the old lift. Died October 3, | | 1 | | | | | | 1 |
| Fatally injured, skull fractured, jammed between two loaded cars, | | | | | 1 | | | 1 |
| Fatally injured through an explosion of gas. Died October 30, | 1 | | | | | | | 1 |
| Killed by a fall of coal, while enlarging the safety-hole at bottom of the slope, | | 1 | | | | | | 1 |
| Fatally injured by a fall of coal in the gangway, | | 1 | | | | | | 1 |
| Killed by falling into the breaker rolls, | | | | | | | 1 | 1 |
| Fatally injured by a rush of coal in the man-way, while he was going up the breast, | | 1 | | | | | | 1 |
| Fatally injured by being struck by a mine car and run over, at bottom slope, | | | | | 1 | | | 1 |
| Fatally injured by a fall of coal, while commencing to open a breast, | | 1 | | | | | | 1 |
| | 2 | 15 | 2 | | 2 | | 4 | 25 |

**Recapitulation.**

| | 1879. | 1878. |
|---|---|---|
| By explosions of carbureted hydrogen gas, | 2 | 2 |
| By falls of coal, roof, and sides, | 15 | 15 |
| By hoisting machinery breaking, | 2 | 2 |
| By mine cars, | 2 | 1 |
| By premature blasts, | | 3 |
| By miscellaneous under ground, | | 1 |
| By miscellaneous above ground, | 4 | 6 |
| | 25 | 30 |

TABLE No. 2.—*List of Accidents not proving fatal in the South District of*

| DATE. | No. of accident. | LOCATION. | NAME OF PERSON INJURED. |
|---|---|---|---|
| Jan. 6 | 1 | Hollywood, | Elias Jenkins, |
| 22 | 2 | Cranberry, | John Hawk, |
| 23 | 3 | Crystal Ridge, | Edward Winn, |
| Feb. 4 | 4 | Beaver Brook, | Peter Boyle, |
| 7 | 5 | Room Run, | Thomas Smitham, |
| 13 | 6 | Tresckow, | John Harlan, |
| 17 | 7 | Tresckow, | Philip Smith, |
| 21 | 8 | East Sugar Loaf, | Samuel Cook, |
| 27 | 9 | East Sugar Loaf, | William Ford, (boy,) |
| Mar. 5 | 10 | Humboldt, No. 4, | Owen Farley, |
| 14 | 11 | Crystal Ridge, | James Harlan, |
| 19 | 12 | Humboldt, No. 4, | James Carpenter, |
| 22 | 13 | Sugar Loaf, | Frank Gallagher, |
| 27 | 14 | Oak Dale, No. 1, | John Brenan, |
| April 8 | 15 | Tresckow, No. 6, | Michael Rodgers, |
| 10 | 16 | East Sugar Loaf, | Andrew Popp, |
| 22 | 17 | Hazleton Mines, | Henry Hugo, |
| 22 | 18 | Hazleton Mines, | Jacob Fey, |
| 26 | 19 | Council Ridge, No. 5, | Coony Lamb, |
| 28 | 20 | Room Run, | Edward Riley, |
| 31 | 21 | Highland, No. 1, | Patrick McDevit, |
| May 1 | 22 | Coleraine, No. 2, | Frederick Israel, |
| 1 | 23 | Upper Lehigh, | Charles Conohan, |
| 12 | 24 | Room Run, | John McKenna, |
| 17 | 25 | Cranberry, | Frederick Dersch, |
| 21 | 26 | Crystal Ridge, | Christ Schade, |
| 22 | 27 | Ebervale, | Joseph Boyce, |
| June 2 | 28 | Tresckow, | Cornelius McHugh, |
| 6 | 29 | Harleigh, | Hugh Duffy, |
| 9 | 30 | East Sugar Loaf, | James McGeehan, |
| 11 | 31 | East Sugar Loaf, | Daniel Gallagher, |
| 16 | 32 | Spring Brook, | Patrick McClafferty, |
| 17 | 33 | East Sugar Loaf, No. 4, | John Smith, |
| 18 | 34 | East Sugar Loaf, No. 4, | John Burns, |
| 19 | 35 | East Sugar Loaf, No. 4, | Patrick Reiley, |
| 20 | 36 | Ebervale, No. 3, | William Friel, (boy,) |
| 21 | 37 | Room Run, No. 3, | William Hammond, |
| 22 | 38 | Spring Mountain, No. 5, | John Conrad, |
| 22 | 39 | Council Ridge, | John McCally, |
| 25 | 40 | Mount Pleasant, | William Fishburn, |
| 30 | 41 | Lattimer, | John Shafer, |
| July 7 | 42 | Ebervale, | Robert Boyd, |
| 8 | 43 | Sugar Loaf, No. 1, | John Colehouse, |
| 18 | 44 | Lattimer, No. 2, | |
| 19 | 45 | Panther Creek, No. 9, | John Hill, |
| 19 | 46 | Upper Lehigh, No. 4, | James Rhodes, |
| 20 | 47 | Highland, No. 2, | Edward McHugh, |
| 20 | 48 | Highland, No. 2, | Andrew Dever, |
| 24 | 49 | Lattimer, No. 2, | John Brodrick, |
| Aug. 6 | 50 | Panther Creek, No. 9, | Christ Wising, |
| 14 | 51 | Upper Lehigh, No. 2, | Albert Boughman, (boy,) |
| 20 | 52 | Tresckow Stripping, | John Ferry, |
| 20 | 53 | Room Run, | Daniel McHugh, |
| 21 | 54 | East Sugar Loaf, No. 2, | Jacob Greenwalt, |

*Luzerne and Carbon counties, during the year ending December 31, 1879.*

| NATURE AND CAUSES OF ACCIDENTS. | NUMBER OF ACCIDENTS. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Explosions of CH4 gas. | Falls of coal, roof, and sides. | Explosions of blasting powder. | By mine cars | In slopes. | Miscellaneous—under ground. | Miscellaneous—above ground. | Total. |
| Slightly injured by a fall of coal. Not considered serious, | | 1 | | | | | | 1 |
| Severely injured in the foot, from an iron splinter off the T rail running into it, | | | | | | 1 | | 1 |
| Injured on the shoulders by a fall of clod. Not deemed serious, | | 1 | | | | | | 1 |
| Leg injured by a fall of clod, | | 1 | | | | | | 1 |
| Burned by an explosion of carbureted hydrogen gas. Not dangerous, | 1 | | | | | | | 1 |
| Slightly injured about the head and shoulders by a fall of clod, | | 1 | | | | | | 1 |
| Severely injured by a fall of coal, | | 1 | | | | | | 1 |
| Slightly injured by a fall of coal, | | 1 | | | | | | 1 |
| Arm broken and severely lacerated by breaker machinery, | | | | | | | 1 | 1 |
| Injured by falling under the mine car, | | | | 1 | | | | 1 |
| Injured by a fall of coal. Necessitating amputation of a leg, | | 1 | | | | | | 1 |
| Slightly injured by a fall of clod, | | 1 | | | | | | 1 |
| Injured by a premature blast, | | | | | | 1 | | 1 |
| Arm broken by falling under the timber truck at mouth of slope, | | | | | | | 1 | 1 |
| Leg and nose broken and injured otherwise by a fall of roof, | | 1 | | | | | | 1 |
| Slightly injured in the foot by a fall of four-foot bench of coal, | | 1 | | | | | | 1 |
| Both dangerously injured by an explosion of fire-damp. Fey was severely burned. They are able to work again. They fired a shot which liberated some gas, which ignited from their light in the man-way, | 2 | | | | | | | 2 |
| Three ribs broken and severely cut about the head by a fall of coal, | | 1 | | | | | | 1 |
| Amputation of a leg, caused by being run over by mine car, | | | | 1 | | | | 1 |
| Slightly hurt on the shoulder by a fall of coal, | | 1 | | | | | | 1 |
| Leg broken by a lump of coal sliding against it and catching him between a prop, | | | | | | 1 | | 1 |
| Leg amputated. His foot caught in a frog casting and car ran over it, | | | | 1 | | | | 1 |
| Compound fracture of the leg below the knee. Bumped between the mine locomotive and the mine car, | | | | 1 | | | | 1 |
| Dangerously injured by trestling falling on him. Breaker was on fire, | | | | | | | 1 | 1 |
| Dangerously injured by being caught between car and platform, | | | | 1 | | | | 1 |
| Amputation of two fingers, by a piece of coal falling on his hand, | | 1 | | | | | | 1 |
| Leg broken by a fall of roof in his breast, | | 1 | | | | | | 1 |
| Severely cut about the head by a fall of roof, while robbing a pillar, | | 1 | | | | | | 1 |
| Small bone of his leg broken while getting out of the car at bottom of the slope, | | | | 1 | | | | 1 |
| Bruised about the head and foot by a fall of coal, | | 1 | | | | | | 1 |
| Slightly injured by a fall of slate in Wharton vein, | | 1 | | | | | | 1 |
| These three men were injured by a fall of clod in the Wharton vein gangway, close to the face of the same, | | 3 | | | | | | 3 |
| Arm lacerated while in the act of taking a sprag out of the car while in motion. Necessitating amputation, | | | | 1 | | | | 1 |
| Severely burned about face and hands by an explosion of blasting powder, | | | 1 | | | | | 1 |
| Dangerously injured by falling down the breaker, a distance of forty-one feet, while running home at quitting time, | | | | | | | 1 | 1 |
| Severely injured by a fall of the dividing slate, while turning a breast off the gangway, | | 1 | | | | | | 1 |
| Slightly hurt by a prop rolling down the slope. Caused by the breaking of the rope, | | | | | 1 | | | 1 |
| Thumb amputated. Caused by being caught between a plank and a crow-bar, | | | | | | 1 | | 1 |
| Hand badly mashed by a piece of coal falling on it, | | 1 | | | | | | 1 |
| Collar-bone broken. Caught between the car and center prop, | | | | 1 | | | | 1 |
| Foot severely hurt by a crow-bar nearly piercing through it, | | | | | | 1 | | 1 |
| Injured by a fall of coal, | | 1 | | | | | | 1 |
| Arm broken by a kick from a mule, | | | | | | 1 | | 1 |
| Collar-bone broken and otherwise hurt by the breaking of the hoisting rope. Dever was injured by the same cause. These two men were sitting or waiting at the bottom of the slope at the time, | | | | | 2 | | | 2 |
| Severely hurt by a fall of coal in the breast, | | 1 | | | | | | 1 |
| Severely injured by being jammed between the car while passing from manway on the way home, | | | | | | 1 | | 1 |
| Leg amputated. Caused by attempting to get on transportation cars while in motion, | | | | | | | 1 | 1 |
| Severely cut about the face by a fall of clay at stripping of the coal, | | | | | | | 1 | 1 |
| Severely burned about face and hands, by explosion of blasting powder, | | | 1 | | | | | 1 |
| Foot bruised by a fall of coal, | | 1 | | | | | | 1 |

TABLE No. 2—

| DATE. | No. of accident. | LOCATION. | NAME OF PERSON INJURED. |
|---|---|---|---|
| Aug. 25 | 55 | Sandy Run, | John Handlon, |
| 28 | 56 | East Sugar Loaf, No. 2, | Lewis Griffiths, |
| 28 | 57 | East Sugar Loaf, No. 2, | Evan Griffiths, |
| 29 | 58 | Humboldt, | Thomas Carpenter, |
| 29 | 59 | Ebervale, No. 3, | John Gallagher, |
| Sept. 4 | 60 | Sugar Loaf, | Frederick Meyers, |
| 5 | 61 | Tresckow, No. 6, | John Gallagher, |
| 11 | 62 | Room Run, | James Gallagher, |
| 11 | 63 | Room Run, | James Lemon, |
| 11 | 64 | Sandy Run, | Joseph Sherman, (boy,) |
| 12 | 65 | Room Run, | David L. Thomas, |
| 15 | 66 | Spring Mountain, | Patrick Boyle, |
| 16 | 67 | Sandy Run, | Samuel Wyatt, |
| 16 | 68 | Laurel Hill, (old lift,) | George Millar, junior, |
| 16 | 69 | Spring Brook, | Patrick McElvain, |
| 17 | 70 | Ebervale, | Patrick Sweeney, |
| 18 | 71 | Beaver Brook, | Thomas Thomas, |
| 20 | 72 | Coleraine, No. 4, | John Watkins, |
| 20 | 73 | Panther Creek, No. 5, | Cornelius Boyle, |
| 24 | 74 | Panther Creek, No. 9, | Abraham Morgans, |
| 25 | 75 | Laurel Hill, | George Millar, senior, |
| Oct. 2 | 76 | Humboldt, | Christain Shure, |
| 2 | 77 | Buck Mountain, | Condy Ward, |
| 4 | 78 | Upper Lehigh, | Michael Dodggt, |
| 6 | 79 | Coleraine, | Fritz Heiserman, |
| 9 | 80 | Room Run, | Charles Fritz, |
| 9 | 81 | East Sugar Loaf, No. 2, | William Airey, senior, |
| 10 | 82 | East Sugar Loaf, No. 2, | John T. Richards, |
| 13 | 83 | Mount Pleasant, | Henry Hollar, |
| 28 | 84 | Room Run, | Jones Goddles, |
| 28 | 85 | Room Run, | Thomas Halpin, |
| Nov. 5 | 86 | Panther Creek, No. 5, | Charles Wilson, (boy,) |
| 4 | 87 | Laurel Hill, | William Fletcher, |
| 1 | 88 | Mount Pleasant, | Anthony Reily, |
| 10 | 89 | Laurel Hill, | William Neusbahin, |
| 13 | 90 | Panther Creek, No. 4, | William York, |
| 14 | 91 | Mount Pleasant, | Joseph McShea, |
| 22 | 92 | Beaver Brook, | Simon Zimmerman, |
| 27 | 93 | Oak Dale, | John Brenan, |
| 24 | 94 | Cranberry, | John Koch, |
| Dec. 2 | 95 | Pond Creek, | Robert Kehoe, |
| 6 | 96 | Upper Lehigh, | William Jones, |
| 12 | 97 | Sandy Run, | George Smith, |
| 20 | 98 | Cross Creek, No. 1, | John Gillespie, |
| 22 | 99 | Spring Mountain, | Thomas McGarvey, |
| 24 | 100 | Laurel Hill, | Jacob Shoemaker, |

Continued.

| NATURE AND CAUSES OF ACCIDENTS. | NUMBER OF ACCIDENTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Explosions of CH4 gas. | Falls of coal, roof, and sides. | Explosions of blasting powder. | By mine cars. | In slopes. | Miscellaneous—under ground | Miscellaneous—above ground. | Total. |
| Jammed between the car and rib while riding on the side of the car, | . | . | . | 1 | . | . | . | 1 |
| These two men were severely burned by an explosion of gas. The fire-boss had reported everything all right to them, and when they entered the breast the gas ignited, | 2 | . | . | . | . | . | . | 2 |
| Leg badly bruised by falling under the car while in motion, | . | . | . | 1 | . | . | . | 1 |
| Severely injured by falling down the slope while getting out of the car at bottom of second lift, | . | . | . | . | 1 | . | . | 1 |
| Finger amputated by spragging a car, | . | . | . | 1 | . | . | . | 1 |
| Thigh broken and otherwise hurt by a fall of coal, | . | 1 | . | . | . | . | . | 1 |
| Small bone of the leg broken by a fall of coal in the breast, | . | 1 | . | . | . | . | . | 1 |
| Finger hurt by spragging a car. Probably require amputation, | . | . | . | 1 | . | . | . | 1 |
| Small bone of the arm probably broken, and cut on the hip by falling down in the breaker, | . | . | . | . | . | . | 1 | 1 |
| Foot badly crushed by a piece of slate falling on it, | . | 1 | . | . | . | . | . | 1 |
| Leg and arm broken by a fall of coal in the breast, | . | 1 | . | . | . | . | . | 1 |
| Injured about the face, hands, and shoulders by a fall of dividing slate, | . | 1 | . | . | . | . | . | 1 |
| Kicked by a mule, in the face. Not serious, | . | . | . | . | . | 1 | . | 1 |
| Slightly injured on the shoulder by a fall of coal, | . | 1 | . | . | . | . | . | 1 |
| Injured about head and shoulders by a fall of two-foot bench of coal, | . | 1 | . | . | . | . | . | 1 |
| Injured by a fall of coal in the breast, | . | 1 | . | . | . | . | . | 1 |
| Collar-bone probably broken by falling from the platform to gangway, | . | . | . | . | . | 1 | . | 1 |
| Leg broken and badly hurt about the body by being drawn around a revolving shaft on breaker, | . | . | . | . | . | . | 1 | 1 |
| Man tending door, collar bone broken by a mine car jumping track, | . | . | . | 1 | . | . | . | 1 |
| Seriously hurt by a fall of roof in the breast, | . | 1 | . | . | . | . | . | 1 |
| Slightly hurt on the knee by a piece of coal slipping down on the drill, | . | 1 | . | . | . | . | . | 1 |
| Slightly hurt by a fall of the dividing slate. Did not examine roof after firing a shot, | . | 1 | . | . | . | . | . | 1 |
| Slightly hurt by a fall of top coal, | . | 1 | . | . | . | . | . | 1 |
| Carpenter injured by falling into breaker chute, a height of about 9 feet, | . | . | . | . | . | . | 1 | 1 |
| Fracture of small bone of leg by falling between two sticks of timbers, | . | . | . | . | . | . | 1 | 1 |
| Slightly burned by fire-damp, | 1 | . | . | . | . | . | . | 1 |
| Injured by some coal falling on him, which he was barring down at the time, | . | 1 | . | . | . | . | . | 1 |
| Driver on dirt bank. Squeezed between the car and breaker timbers, | . | . | . | . | . | . | 1 | 1 |
| Both severely burned by an explosion of gas. The gas had accumulated in the breast over the turnout they were making, owing to the fan being stopped during the night previous, due to scarcity of water to generate steam. The driver, who afterwards died, endeavored to assist them in sawing off the forepoles, ignited the gas, | 2 | . | . | . | . | . | . | 2 |
| Employed at uncoupling the cars at foot of plane. Was hurt by being jammed between the cars, | . | . | . | . | . | . | 1 | 1 |
| Slightly injured by a fall of coal, | . | 1 | . | . | . | . | . | 1 |
| Injured by falling while running away from blast, | . | . | . | . | . | 1 | . | 1 |
| Slightly cut about the head by a fall of coal, | . | 1 | . | . | . | . | . | 1 |
| Dangerously hurt, hit on head by a piece of plank falling down slope, | . | . | . | . | . | 1 | . | 1 |
| Crushed between cars and pillar. Not considered dangerous, | . | . | . | 1 | . | . | . | 1 |
| Leg broken by a fall of clay at the stripping of the coal, | . | . | . | . | . | . | 1 | 1 |
| Leg dislocated by falling down breaker steps, | . | . | . | . | . | . | 1 | 1 |
| Injured in the back by a fall of coal, | . | 1 | . | . | . | . | . | 1 |
| Injured by the car running back on the slope, | . | . | . | . | 1 | . | . | 1 |
| Injured by a fall of coal. Not serious, | . | 1 | . | . | . | . | . | 1 |
| Injured by a fall of coal while lagging timbers, | . | 1 | . | . | . | . | . | 1 |
| Hip dislocated by falling while running cars, | . | . | . | 1 | . | . | . | 1 |
| Injured in the back by flying missiles from a shot. Did not get out of the way in time, | . | . | . | . | . | 1 | . | 1 |
| Injured in the neck by a fall of coal. Not deemed serious, | . | 1 | . | . | . | . | . | 1 |
| Totals, | 8 | 44 | 2 | 15 | 5 | 12 | 14 | 100 |

**Recapitulation.**

| | 1879. | 1878. |
|---|---|---|
| Explosions of CH4 gas, | 8 | 2 |
| Falls of roof and sides, | 44 | 43 |
| Explosions of blasting powder, | 2 | 2 |
| By mine cars, | 15 | 15 |
| By hoisting machinery breaking in slopes, &c., | 5 | |
| Miscellaneous, under ground, | 12 | 4 |
| Miscellaneous, above ground, | 14 | 4 |
| Totals, | 100 | 70 |

**TABLE No. 3.**—*Exhibits the number of slopes and coal breakers in operation, and the ending December*

| | NAME OF COLLIERY. | BY WHOM OPERATED. | NUMBER OF | | | |
|---|---|---|---|---|---|---|
| | | | Slopes. | Tunnels and drifts. | Breakers or collieries. | Days in operation. |
| | *Green Mountain basin:* | | | | | |
| 1 | Upper Lehigh, No. 2, | Upper Lehigh Coal Company, | 2 | | 1 | 248.5 |
| 2 | Upper Lehigh, No. 4, | Upper Lehigh Coal Company, | 2 | | 1 | 244.9 |
| 3 | Pond Creek, (new plant,) | Pond Creek Coal Co., (limited,) | 1 | | 1 | |
| | *Little Black Creek basin:* | | | | | |
| 4 | Sandy Run, No. 1, | M. S. Kemmerer & Co., | 3 | | 1 | 214.2 |
| 5 | Highland, No. 1, | G. B. Markle & Co., | 1 | | 1 | 220 |
| 6 | Highland, No. 2, | G. B. Markle & Co., | 1 | | 1 | 177 |
| 7 | Cross Creek, No. 1, | Coxe Brothers & Co., | 1 | | 1 | 260 |
| 8 | Cross Creek, No. 2, | Coxe Brothers & Co., | 1 | | 1 | 247 |
| 9 | Cross Creek, No. 3, | Coxe Brothers & Co., | 2 | | 1 | 57.5 |
| 10 | Lattimer, No. 1, | Pardee Brother & Co., | 1 | | 1 | 206 |
| 11 | Lattimer, No. 2, | Pardee Brother & Co., | 1 | | 1 | 183 |
| 12 | Milnesville, No. 6, | Stout Coal Company, | 1 | | 1 | 175 |
| 13 | Milnesville, No. 7, | Stout Coal Company, | 1 | | 1 | 87 |
| 14 | Hollywood, No. 1, | Calvin Pardee & Co., | 2 | | 1 | 177.6 |
| | *Big Black Creek basin:* | | | | | |
| 15 | Buck Mountain, | Buck Mountain Coal Company, | 4 | | 1 | 184.7 |
| 16 | Council Ridge, No. 2, | J. Leisenring & Co., | 1 | | 1 | 232.2 |
| 17 | Council Ridge, No. 5, | J. Leisenring & Co., | 1 | | 1 | 163.7 |
| 18 | Oak Dale, No. 1, | G. B. Markle & Co., | 1 | | 1 | 216 |
| 19 | Oak Dale, No. 2, | G. B. Markle & Co., | 1 | | 1 | 193 |
| 20 | Ebervale, No. 2, | Ebervale Coal Company, | 2 | | 1 | 178.2 |
| 21 | Ebervale, No. 3, | Ebervale Coal Company, | 1 | | 1 | 172 |
| 22 | Harleigh, No. 1, | McNair & Co., | 2 | | †2 | 131 |
| 23 | Stanton, (Gowen,) | Now leased by Coxe Bros. & Co., | *1 | D. 2 | | 30 |
| 24 | West Cross Creek, (Gowen,) | Coxe Brothers & Co., | 1 | D. 1 | 1 | 100 |
| | *Hazleton basin:* | | | | | |
| 25 | East Sugar Loaf, No. 2, | Linderman, Skeer & Co., | 1 | | 1 | 186.7 |
| 26 | East Sugar Loaf, No. 3, | Linderman, Skeer & Co., | 1 | | 1 | 224.6 |
| 27 | East Sugar Loaf, No. 5, | Linderman, Skeer & Co., | 2 | | 1 | 209.1 |
| 28 | South Sugar Loaf, | A. Pardee & Co. [Idle in 1879,] | 1 | | 1 | |
| 29 | Sugar Loaf, | A. Pardee & Co., | 2 | | 1 | 148.6 |
| 30 | Laurel Hill, | A. Pardee & Co., | 1 | | 1 | 190.7 |
| 31 | Hazleton mines, | A. Pardee & Co., | 1 | | 1 | 224.6 |
| 32 | Crystal Ridge, | A. Pardee & Co., | 1 | | 1 | 157.6 |
| 33 | Cranberry, | A. Pardee & Co., | 1 | | 1 | 96.5 |
| 34 | Mount Pleasant, | Pardee & Sons, | 2 | | 1 | 164.5 |
| 35 | Humboldt, | Linderman, Skeer & Co., | 1 | | 1 | 157.3 |
| 36 | Crystal Ridge, No. 6, | A. Pardee & Co. [Idle in 1879,] | 1 | | 1 | |
| | *Beaver Meadow basin:* | | | | | |
| 37 | Stafford, (Beaver Meadow, | Not in operation in 1879, | 2 | | 1 | |
| 38 | Coleraine, No. 1, | C. F. Shoener, | 1 | | 1 | 254 |
| 39 | Coleraine, No. 2, | C. F. Shoener, | 2 | | 1 | 106.5 |
| 40 | Spring Mountain, No. 1, | J. C. Haydon & Co., | 1 | | 1 | 227 |
| 41 | Spring Mountain, No. 4, | J. C. Haydon & Co., | 2 | | 1 | |
| 42 | Spring Mountain, No. 5, | J. C. Haydon & Co., | 1 | T. 1 | 1 | 224 |
| 43 | Beaver Brook, No. 2, | —— Dotson, | 2 | | †2 | 198 |
| 44 | Spring Brook, | Thomas John & Co., | 1 | | 1 | 206.7 |
| 45 | Spring Brook, | Thomas John & Co., | 1 | | 1 | 194.5 |
| 46 | Treseckow, No. 6, | E. B. Leisenring, | 1 | | 1 | 206.6 |
| | *Mauch Chunk and Tamaqua basin:* | | | | | |
| 47 | Room Run, | Lehigh Coal and Nav. Company, | 1 | S. 1<br>T. 1 | 1 | 278 |
| 48 | Hackleberney, | Lehigh Coal and Nav. Company, | | T. 1 | | |
| 49 | Panther Creek, No. 4, | Lehigh Coal and Nav. Company, | 1 | | 1 | |
| 50 | Panther Creek, No. 5, | Lehigh Coal and Nav. Company, | 1 | T. 1 | 1 | 62.5 |
| 51 | Panther Creek, No. 6, | Lehigh Coal and Nav. Company, | | T. 1 | 1 | 271 |
| 52 | Panther Creek, No. 9, | Lehigh Coal and Nav. Company, | 1 | T. 1 | 1 | 272.5 |

*number of employés, also the tonnage of coal sent to market, &c., during the year 31, 1879.*

| NUMBER OF UNDER GROUND WORKMEN. | | | | | NUMBER OF SURFACE WORKMEN. | | | | TOTAL NUMBER | | | Coal market—ton of 2240 pounds. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Miners. | Laborers. | Bosses and company men. | Drivers and door boys. | Total under ground. | Mechanics. | Bosses and company men. | Drivers and slate pickers. | Total on surface. | Employed. | Mules. | Kegs of powder (twenty-five pounds each) used. | | |
| 63 | 47 | 13 | 26 | 149 | 9 | 22 | 49 | 80 | 229 | 51 | 3,257 | 169,249.07 | 1 |
| 58 | 50 | 9 | 20 | 137 | 8 | 18 | 46 | 72 | 209 | 22 | 3,922 | 162,150.19 | 2 |
| 12 | 24 | 2 | . . | 38 | 6 | 10 | . . . . | 16 | 54 | 4 | 300 | . . . . . | 3 |
| 52 | 53 | 9 | 15 | 129 | 7 | 27 | 17 | 51 | 180 | 20 | 1,870 | 88,791.16 | 4 |
| 90 | 8 | 10 | 24 | 132 | 3 | 28 | 49 | 80 | 212 | 37 | 2,288 | 100,937.17 | 5 |
| 67 | 6 | 8 | 12 | 93 | 3 | 22 | 43 | 68 | 161 | 26 | 1,858 | 83,791.01 | 6 |
| 82 | 33 | 35 | 33 | 183 | 16 | 20 | 103 | 139 | 322 | 30 | 3,901 | 221,652.02 | 7 |
| 57 | 50 | 22 | 13 | 142 | 6 | 13 | 100 | 119 | 261 | 28 | 3,107 | 151,312.18 | 8 |
| 25 | 18 | 7 | 7 | 57 | 2 | 2 | 25 | 29 | 86 | 12 | 195 | 5,455.11 | 9 |
| 52 | 14 | 17 | 6 | 89 | 6 | 12 | 65 | 83 | 172 | 26 | 1,463 | 131,139.19 | 10 |
| 41 | 9 | 19 | 6 | 75 | 5 | 12 | 66 | 83 | 158 | 17 | 1,462 | 84,210 | 11 |
| 43 | 34 | 13 | 11 | 101 | 6 | 47 | 25 | 78 | 179 | 20 | 1,037 | 74,714.18 | 12 |
| 6 | 6 | 3 | 2 | 17 | 2 | 12 | 10 | 24 | 41 | 3 | 86 | 12,142.04 | 13 |
| 28 | 19 | 14 | 5 | 66 | 7 | 32 | 37 | 76 | 142 | 25 | 1,126 | 80,813 | 14 |
| 110 | 22 | 52 | 26 | 210 | 32 | 47 | 57 | 136 | 346 | 63 | 1,562 | 149,034.08 | 15 |
| 81 | 44 | 9 | 20 | 154 | 6 | 15 | 40 | 61 | 215 | 38 | 2,567 | 116,947.03 | 16 |
| 24 | 23 | 9 | 3 | 59 | 2 | 9 | 18 | 29 | 88 | 9 | 439 | 28,095.03 | 17 |
| 77 | 7 | 7 | 19 | 110 | 3 | 23 | 35 | 61 | 171 | 25 | 1,455 | 108,729.02 | 18 |
| 76 | 4 | 10 | 18 | 108 | 3 | 21 | 35 | 59 | 167 | 33 | 1,633 | 91,229.05 | 19 |
| 81 | 6 | 22 | 23 | 132 | 18 | 33 | 41 | 92 | 224 | 36 | 2,331 | 113,457 | 20 |
| 60 | . . . . | 11 | 13 | 84 | 2 | 21 | 39 | 62 | 146 | 19 | 1,339 | 83,111 | 21 |
| 41 | 25 | 3 | 7 | 76 | 10 | 30 | 41 | 81 | 157 | 19 | 771 | 34,245.06 | 22 |
| 2 | 2 | 2 | . . | 6 | . . . . | . . | 4 | 4 | 10 | 1 | 4 | 156 | 23 |
| 10 | 14 | 1 | 4 | 29 | 1 | 20 | . . . . | 21 | 50 | 8 | 50 | 2,249.14 | 24 |
| 43 | 18 | 10 | 8 | 79 | 4 | 21 | 20 | 45 | 124 | 10 | 696 | . . . . . | 25 |
| 47 | 34 | 13 | 2 | 96 | 6 | 26 | 21 | 53 | 149 | 20 | 1,349 | . . . . . | 26 |
| 60 | 70 | 23 | 4 | 157 | 8 | 46 | 35 | 89 | 246 | 38 | 2,049 | 226,908 | 27 |
| . . . . | . . . . | . . . . | . . . . | . . . . | 4 | . . . . | . . | 4 | 4 | . . | . . . . | . . . . . | 28 |
| 40 | 22 | 5 | 4 | 71 | 9 | 27 | 36 | 72 | 143 | 16 | 1,366 | 52,253.05 | 29 |
| 68 | 38 | 16 | 14 | 136 | 16 | 35 | 70 | 121 | 257 | 54 | 1,399 | 207,765.17 | 30 |
| 53 | 13 | 8 | 7 | 81 | 8 | 26 | 37 | 71 | 152 | 22 | 988 | | 31 |
| 2 | 8 | 2 | . | 12 | 8 | 26 | 22 | 56 | 68 | 15 | 786 | 112,654.12 | 32 |
| 71 | 38 | 8 | 9 | 126 | 11 | 46 | 28 | 85 | 211 | 26 | 1,080 | | 33 |
| 42 | 14 | 18 | 7 | 81 | 5 | 27 | 28 | 60 | 141 | 28 | 1,399 | 69,930.15 | 34 |
| 40 | 8 | 5 | 7 | 60 | 3 | 18 | 23 | 44 | 104 | 13 | 1,373 | 50,000 | 35 |
| 3 | 10 | 1 | . . . | 14 | 6 | 4 | . . . . | 6 | 6 | . . . . | 6 | . . . . . | 36 |
| | | | | | 9 | | | 13 | 27 | | 48 | | |
| . . . . | . . | . . . | . . . | . . . . | . . . . | . . . . . | . . . . | . . . . | . . . . | . . . | . . . . | . . . . . | 37 |
| 35 | 29 | 12 | 8 | 84 | 6 | 16 | 50 | 72 | 156 | 20 | 1,444 | 115,900 | 38 |
| 11 | 42 | 11 | 10 | 74 | 6 | 15 | 29 | 50 | 124 | 15 | 1,017 | 24,328 | 39 |
| 45 | 33 | 7 | 19 | 104 | 5 | 36 | 43 | 84 | 188 | 21 | 1,672 | 73,094 | 40 |
| 14 | 2 | . . . | . . . | 16 | 2 | 4 | 1 | 7 | 23 | 2 | . . . . | . . . . . | 41 |
| 69 | 36 | 8 | 24 | 137 | 4 | 36 | 43 | 83 | 220 | 31 | 2,508 | 109,640 | 42 |
| 41 | 34 | 10 | 15 | 100 | 18 | *25 | 36 | 88 | 188 | 32 | 1,204 | 77,000 | 43 |
| | | | | | | 15 | | | | | | | |
| 35 | 30 | 22 | 14 | 101 | 7 | 29 | 29 | 65 | 166 | 18 | . . . . | . . . . . | 44 |
| 42 | 40 | 21 | 15 | 118 | 5 | 18 | 29 | 52 | 170 | 17 | 2,861 | 145,244.16 | 45 |
| 66 | 53 | 1 | 24 | 144 | 11 | 113 | 84 | 208 | 352 | 49 | 2,455 | 109,137.18 | 46 |
| 81 | 87 | 29 | 36 | 233 | 14 | 64 | 65 | 143 | 376 | 51 | 1,500 | 99,123.11 | 47 |
| 2 | 2 | . . . | 1 | 5 | . . . . | 2 | 2 | 4 | 9 | 2 | . . . . | Local sales. | 48 |
| . . . . | . . . . | . . . . | . . . . | . . . . | 4 | 4 | . . | 8 | 8 | . . . . | . . . . | . . . . . | 49 |
| 38 | 59 | 5 | 22 | 124 | 15 | 27 | 70 | 112 | 236 | 34 | 180 | 22,224.09 | 50 |
| 69 | 55 | 10 | 15 | 149 | 11 | 33 | 65 | 109 | 258 | 26 | 1,089 | 108,007.04 | 51 |
| 94 | 72 | 41 | 45 | 252 | 21 | 47 | 141 | 209 | 461 | 61 | 1,620 | 151,780.16 | 52 |

TABLE No. 3—

| | NAME OF COLLIERY. | BY WHOM OPERATED. | NUMBER OF | | | |
|---|---|---|---|---|---|---|
| | | | Slopes. | Tunnels and drifts. | Breakers or collieries. | Days in operation. |
| | *Mauch C'k and Tamaqua basin—Con.* | | | | | |
| 53 | Panther Creek, No. 8, Mt. Tunnel, . . | Lehigh Coal and Nav. Company, | . . . | T. 1 | . . . | . . . . |
| 54 | Panther Creek, No. 6, West Mt. Tunnel, | Lehigh Coal and Nav. Company, | . . . | T. 1 | . . . | . . . . |
| 55 | Panther Creek, No. 6, East Mt. Tunnel, | Lehigh Coal and Nav. Company, | . . . | T. 1 | . . . | . . . . |
| 56 | Screen building, . . . . . | Lehigh Coal and Nav. Company, | . . . | . . . | 1 | . . . . |
| | Totals for 1879, . . . . . | . . . . . | 67 | 13 | 53 | 8,360 |
| | Totals for 1878, . . . . . | . . . . . | 63 | 12 | 52 | 5,564 |
| | Difference, . . . . . | . . . . . | 4 | 1 | 1 | 2,796 |

* Chute.
† Only one of these breakers in operation this year.
Number of collieries in operation during 1879, 40.
T—tunnels; D—drifts; S—shafts.

Eight of the above collieries were idle during the whole of last year, and five worked about one sixth time, hence nearly the entire shipments of coal of the district was done by forty breakers or collieries.

The average time for each of the forty breakers to work was two hundred and nine days.

**Continued.**

| NUMBER OF UNDER GROUND WORKMEN. | | | | | NUMBER OF SURFACE WORKMEN. | | | | TOTAL NUMBER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Miners. | Laborers. | Bosses and company men. | Drivers and door boys. | Total under ground. | Mechanics. | Bosses and company men. | Drivers and slate pickers. | Total on surface. | Employed. | Mules. | Kegs of powder (twenty-five pounds each) used. | Coal market—ton of 2240 pounds. | |
| 20 | 18 | 1 | 5 | 44 | 1 | . . . | . . . | 1 | 45 | 6 | . . . . | ‡ | 53 |
| 14 | 9 | 5 | . . . | 28 | 1 | 10 | . . . . | 11 | 39 | 10 | 395 | ‡ | 54 |
| 21 | 7 | 1 | 4 | 33 | 1 | 10 | . . | 11 | 44 | 10 | 720 | ‡ | 55 |
| . . . . | . . . . | . . . . | . . | . . . | 3 | 43 | 29 | 75 | 75 | 3 | . . . . | . . . . . | 56 |
| 2,404 | 1,399 | 600 | 622 | 5,025 | 395 | 1,335 | 1,995 | 3,725 | 8,750 | 1,222 | 69,230 | 3,848,598.16 | |
| 2,355 | 1,216 | 783 | 575 | 4,929 | 302 | 1,206 | 2,122 | 3,630 | 8,559 | 1,089 | 51,492 | 2,737,581.12 | |
| 49 | 183 | 183 | 47 | 96 | 93 | 129 | 127 | 95 | 191 | 133 | 17,738 | 1,111,017.04 | |

Marked thus ‡ the coal that was mined is included in that of No. 6 shipments, except that of No. 8, Mount Tunnel, which was dumped on No. 8 breaker.

**TABLE No. 4**—*Exhibits the loss of life by Colliery Accidents in the South District of Luzerne and Carbon counties, during the past nine years.*

| | 1871. | 1872. | 1873. | 1874. | 1875. | 1876. | 1877. | 1878. | 1879. | Total. | Per cent. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Explosions of carbureted hydrogen gas, | ... | 1 | 1 | 2 | 2 | 4 | .. | 2 | 2 | 14 | 5.34 |
| *Falls of coal, roof, and sides:* | | | | | | | | | | | |
| Falls of coal, | 10 | 13 | 17 | 6 | 8 | 13 | 11 | 8 | 12 | 98 | 37.40 |
| Falls of roof, | ... | ... | ... | ... | ... | ... | ... | 5 | 3 | 8 | 3.05 |
| Falls of rock and slate, | 1 | 2 | 4 | 5 | 3 | 5 | 6 | 2 | ... | 28 | 10.70 |
| Total by falls, | 11 | 15 | 21 | 11 | 11 | 18 | 17 | 15 | 15 | 134 | 51.15 |
| *In shafts and slopes:* | | | | | | | | | | | |
| Falling into shafts, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Falling into slopes, | 1 | ... | 1 | ... | ... | 2 | ... | ... | ... | 4 | 1.52 |
| Hoisting machinery breaking, ropes, &c., | ... | ... | ... | 4 | 1 | 1 | ... | 2 | 2 | 10 | 3.82 |
| Sundries in slopes, | 3 | 1 | 1 | .. | ... | ... | .. | ... | ... | 5 | 1.91 |
| Totals in slopes, | 4 | 1 | 2 | 4 | 1 | 3 | ... | 2 | 2 | 19 | 7.25 |
| *By mine cars in gangway:* | | | | | | | | | | | |
| By mine cars, | 5 | 3 | 2 | 6 | ... | 7 | 6 | 2 | 2 | 33 | 12.59 |
| *Miscellaneous under ground:* | | | | | | | | | | | |
| By explosion of blasting powder, | 2 | 1 | .. | ... | ... | 1 | ... | ... | ... | 4 | 1.52 |
| By mules, | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | .40 |
| By premature blasts, | 2 | 4 | 2 | ... | ... | ... | ... | 3 | ... | 11 | 4.19 |
| By sundries, | 1 | ... | 2 | 5 | 5 | 1 | .. | ... | . | 14 | 5.34 |
| Total miscellaneous under ground, | 5 | 3 | 7 | 5 | 5 | 2 | ... | 3 | | 30 | 11.45 |
| Total under ground, | 25 | 23 | 33 | 28 | 19 | 34 | 23 | 24 | 21 | 230 | 87.78 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Above ground:* | | | | | | | | | | | |
| By machinery, | . . | 1 | 1 | . . . | 1 | 2 | 1 | 1 | 3 | 10 | 3.82 |
| By suffocation in breaker chutes, | 2 | . | . | . . . | . | . . . | . . . | . . . | . . | 2 | .76 |
| By mine cars, | 2 | 1 | 3 | . . | 1 | . . . | . | 2 | 1 | 16 | 3.82 |
| By sundries, | . . . | . . | 1 | 3 | . . . | 1 | 2 | 3 | . | 10 | 3.82 |
| Total above ground, | 4 | 2 | 5 | 3 | 2 | 3 | 3 | 6 | 4 | 32 | 12.22 |
| Gross total, | 29 | 25 | 38 | 31 | 21 | 37 | 26 | 30 | 25 | 262 | 100.00 |

It will be observed that during the years 1871, 1874, 1875, there were eleven deaths caused by falls of coal, roof, &c., and during 1872, 1878, 1879, there were fifteen deaths in each of those years, due to the same cause, while in 1873, 1876, 1877, there were twenty-one, eighteen, and seventeen, respectively, making an average (on the whole) of nearly fifteen deaths, or about one half of all the casualties happening in and about the mines in this district. The next prolific source of accidents are those caused by mine cars, and amounts to one eighth of all the accidents. The number of deaths given in the table, under the head of miscellaneous under ground, shows that about eleven and a half per cent. of the whole number, happened through causes under that head, and are about the same as that occurring through mine cars. The number of deaths due to causes above ground, *i. e.* around and about the breakers, are also about the same in number as those by mine cars, and miscellaneous under ground. The deaths caused by explosions of gas, and those given under the head of "in shafts and slopes" are, on the whole, about five and one third, and seven and one quarter per cent., respectively.

**TABLE No. 5.**—*Shows the performance of work done by miners working breasts or chambers in the different coal seams in the Lehigh region, and the earnings made by the same, &c., &c.*

| NAME OF COLLIERY. | COAL SEAM. | | Average number of days worked. | Average number of cars of coal sent to breaker. | Price per car. | Gross earnings. | CONTENTS OF CARS. | | POWDER USED. | | TONS OF COAL MINED. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name. | Thickness, in feet. | | | | | Cubic feet. | Tons—48 cubic feet to the ton. | Kegs—25 pounds each | Pound. | Per day. | During time worked. |
| Ebervale, | E | 28 | 18 | 148 | *$0 73½ | $108 78 | 96 | 2 | 5 1/6 | 129.2 | 16.5 | 296 |
| Coleraine, | E | 28 | 24 | 150 | 61 | 91 50 | 96 | 2 | 5 | 125 | 12.5 | 300 |
| Room Run, | E | 60 | 24.5 | 328 | 55 6/10 | 182 36 | 82 | 1 17/24 | 6 | 150 | 22.9 | 560.3 |
| Hazleton, | E | 30 | 23 | 132 | *81 | 106 92 | 99 | 2 1/16 | 5 5/6 | 146.2 | 10.9 | 272.2 |
| Mount Pleasant, | D | 8½ | 23.3 | 168 | 57 | 95 76 | 84 | 1¾ | 6 1/6 | 154 2 | 12.6 | 294 |
| Tresckow, | D | 8½ | 22 | 115 | 75 | 86 25 | 99 | 2 1/16 | 3 2/3 | 91.6 | 10.8 | 237.2 |
| Coleraine, | D | 9 | 23.25 | 120 | 73 | 87 60 | 96 | 2 | 4½ | 112.5 | 10.8 | 240 |
| Beaver Brook, | D | 8½ | 18.5 | 95 | 75 | 71 25 | 99 | 2 1/16 | 4 | 100 | 10.6 | 195.9 |
| Upper Lehigh, | B | 12 | 26 | 188 | *62 | 116 56 | *90 | 1 21/24 | 7 1/6 | 179.2 | 13.5 | 352.5 |
| Cross Creek, | B | 12 | 24.6 | 145 | 63 | 91 35 | 96 | 2 | 4 5/6 | 121 | 12.2 | 290 |
| Buck Mountain, | B | 12 | 25.8 | 174 | 59⅓ | 103 82 | 74 | 1 13/24 | 4 1/6 | 104.2 | 10.5 | 268.2 |
| Total, | | | | | | $1,142 15 | | | | | | |

This table is compiled by taking the average number of cars sent out from six places in each case, during the time worked.

It will be observed that the highest rate of wages made in the Mammoth vein was $3 33 per day, and the lowest $1 71, and the mean of the four places $2 62.

The highest in the Wharton vein was $1 99 per day, and the lowest $1 57, while the average of the four places is $1 84.

The highest in the Buck Mountain vein is $2 27 per day, and the lowest $1 99—mean of the three places $2 13.

The average number of tons of coal sent out to the breaker per day by a miner and laborer from the Mammoth, Wharton, and Buck Mountain veins, are 16, 11, 12 tons, respectively.

The number of holes drilled and fired per day are about five to six, varying from 4 to 5 feet in length, and 2½ inches in diameter.

The miners are paid by the car, and not by the ton. The time made by the laborers is not given in the table.

I have selected, as near as circumstances permitted, were men worked in flat places, (except that of Room Run,) so as to get at, as near as possible, the amount of work done and the earnings made each day.

TABLE No. 5.—*Continued.*

| Name of Colliery. | Tons of coal mined, for each pound of powder used. | Force employed. | | Expenses. | | | | Net earnings made by miners during time worked. | Rate of wages per day. | Price of coal in market at which men were paid. | When work was done. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Miners. | Laborers. | Powder. | Supplies—oil, wick, shovels, &c. | Labor. | Total expenses. | | | | |
| Ebervale, | 2.29 | 2 | . . . | $12 92 | $3 55 | . . . . . | $16 47 | $46 16<br>46 15 | $2 56<br>2 56 | $3 00 | August. |
| Coleraine, | 2.40 | 1 | 1 | 12 50 | 3 90 | $34 10 | 50 50 | 41 00 | 1 71 | 3 00 | September. |
| Room Run, | 3.74 | 2 | . . . | 16 80 | 2 48 | . . . . . | 19 28 | 81 54<br>81 54 | 3 33<br>3 33 | 3 00 | September. |
| Hazleton, | 1.86 | 1 | 1 | 9 59 | 3 61 | 44 26 | 57 46 | 49 46 | 2 15 | 3 00 | October. |
| Mount Pleasant, | 1.90 | 1 | 1 | 15 42 | 2 80 | 31 00 | 49 22 | 46 54 | 1 99 | 3 00 | |
| Treseckow, | 2.59 | 1 | 1 | 11 25 | 3 51 | 28 53 | 43 29 | 42 96 | 1 98 | 3 00 | September. |
| Coleraine, | 2.13 | 2 | . . | 11 25 | 3 51 | . . . . . | 14 76 | 36 42<br>36 42 | 1 57<br>1 57 | 3 00 | September. |
| Beaver Brook, | 1.96 | 1 | 1 | 10 00 | 2 07 | 20 86 | 32 93 | 38 32 | 2 97 | 3 00 | September. |
| Upper Lehigh, | 1.97 | 1 | 1 | 17 92 | 3 50 | 33 55 | 54 97 | 61 59 | 2 14 | 3 00 | October. |
| Cross Creek, | 2.39 | 1 | 1 | 12 08 | 3 76 | 26 76 | 42 60 | 48 75 | 1 99 | 3 00 | July. |
| Buck Mountain, | 2.57 | 1 | 1 | 10 42 | 3 90 | 30 71 | 45 03 | 58 79 | 2 27 | 3 00 | September. |
| Totals, | . . . | . . . | . . . | $140 15 | $36 69 | $249 77 | $426 51 | $715 64 | | | |

Reference.—E, Mammoth vein; D, Wharton vein; B, Buck Mountain vein.
* Average price paid per car. 48 cubic feet are allowed for a ton of coal, the 8 feet is given to make up for dirt, slate, &c.

**TABLE No 6** - *Exhibits the performance of work done by men driving gangway, the price per lineal yard paid, the gross and net earnings made by the miners, the force employed, &c.*

| NAME OF COLLIERY. | Date. | Coal seam. | | No. of | | Force employed | | | Total force employed. | | Lineal yards of gangway driven. | No. of cars sent out. | | Price paid for | | Contents of cars in | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Name. | Inclination. | 8 hours shift in 24. | Shifts of 8 hours each. | On each shift. | Miners on contract. | Laborers on day's wages. | Miners. | Laborers. | | Coal. | Refuse. | Gangway. | Car of coal. | Cubic feet. | Tons, (48 cubic ft. to the ton.) |
| Hazleton mines, | Aug., 1879, | E, | 55° | 2 | 46 | 3 | 1 | 2 | 2 | 4 | 38 | 178 | 33 | $5 91 | $0 63 | 99. | $2\frac{1}{16}$ |
| East Sugar Loaf, No. 2, | Aug., 1879, | E, | 75° | 2 | 52 | 3 | 1 | 2 | 2 | 4 | $35\frac{1}{3}$ | 240 | 8 | 5 07 | 64 | 100.8 | 2.1 |
| Milnesville, No. 7, | July, 1879, | E, | 40° | 2 | 48 | 3 | 1 | 2 | 2 | 4 | 34 | 138 | 40 | 4 40 | 61 | 96. | 2. |
| Harleigh, No. 4, | Sept., 1879, | E, | 45° | 2 | 46 | 3 | 1 | 2 | 2 | 4 | $43\frac{2}{3}$ | 265 | 16 | 5 40 | 49 | 76. | $1\frac{7}{12}$ |
| Lattimer, | April, 1879, | E, | . . | 1 | 24 | 3 | 1 | 2 | 1 | 2 | $22\frac{2}{3}$ | 72 | 5 | 3 91 | 78 | 124. | $2\frac{7}{12}$ |
| Room Run No. 2, | Aug., 1879, | E, | 55° | 2 | 50 | 3 | 1 | 2 | 2 | 4 | 41 | 319 | 50 | 6 50 | . . . | 82. | $1\frac{17}{24}$ |
| Sandy Run, | Sept., 1879, | B, | 25° | 2 | 46 | 3 | 1 | 2 | 2 | 4 | 36 | 172 | 17 | 3 28 | 68 | 100. | $2\frac{1}{12}$ |
| Hazleton mines, | July, 1871, | E, | 45° | 2 | 50 | 3 | 1 | 2 | 2 | 4 | 44 | 219 | 40 | 7 78 | 1 11 | 99. | $2\frac{1}{16}$ |

| NAME OF COLLIERY. | Kegs of powder used, (25 pounds each.) | Gross earnings. | Expenses. | | | | Net earnings made by miners per month. | Dimensions of gangways | | | Distance from center to center of timbers—feet. | Thickness of timbers—in. | Price of coal in market, at which men were paid. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Powder. | Oil, wick, shovels, paper, &c. | Laborers' earnings | Total. | | Spread—feet. | Collar—feet. | Leg—feet. | | | | |
| Hazleton mines, . . | 12 | $336 72 | $30 00 | $10 57 | $189 65 | $230 22 | $106 50 | 13 | 7 | 9 | 5 | 16 | $3 00 | Coal hard but good blasting. |
| East Sugar Loaf, No. 2, | 6 | 332 74 | 15 00 | 12 89 | 165 32 | 193 21 | 139 53 | 12 | 7½ | 9 | 4 | 16 | 3 00 | Coal hard but free blasting coal, requiring fore-poling. |
| Milnesville,-No. 7, . . | 8 | 233 78 | 20 40 | 6 72 | 113 55 | 140 67 | 93 11 | 12 | 7 | 8 | 5 | 13 | 3 00 | Good blasting, gangway in synclinal axis. |
| Harleigh, No. 4, . . . | 12 | 365 65 | 30 00 | 10 71 | 138 92 | 179 63 | 186 02 | 12½ | 7½ | 9 | 6 | 14 | 3 00 | Coal hard, free blasting coal, gangway driven in the synclinal axis. |
| Lattimer, . . . . . | 8 | 144 79 | 20 00 | 5 04 | 48 96 | 74 00 | 70 79 | 12 | 7 | 9 | 5 | 12 | 2 90 | Gangway driven in the basin. |
| Room Run, No. 2, . . | 11 | 266 50 | 30 80 | 6 24 | 127 16 | 164 20 | 102 30 | 11 | 7 | 8½ | 4½ | 12 | 3 00 | Gangway not in the basin. |
| Sandy Run, . . . . . | 12 | 235 04 | 31 20 | 11 84 | 102 44 | 145 48 | 89 56 | 13 | 7 | 8½ | 5 | 12 | 3 00 | Gangway not in the basin. |
| Hazleton mines, . . . | 11 | 585 41 | 44 00 | 15 00 | 253 00 | 312 00 | 273 41 | 13 | 7½ | 9 | 5 | 16 | 5 60 | Gangway driven in synclinal axis. |
| | | 2,500 63 | 221 40 | 79 01 | 1,139 00 | 1,439 41 | 1,061 22 | | | | | | | |

The net earnings is the wages made by as many miners as were employed in driving the gangway.

The per centum of breakage due to blasting of the coal in gangway work, varies from 15 to 40 per cent. That is, it increases in bulk to that amount. It will be noticed that the greatest yardage driven in a given time, as recorded in this table, was done at the Harleigh mines. The table shows that they drove forty-three and two thirds yards of timbered gangway in forty-six shifts, of eight hour shift, equivalent to about forty-nine yards in fifty-two shift, or a full month's work. This is considered extraordinary gangway driving. I have known one hundred and one and two thirds yards gangway, not timbered, to be driven in hard coal, requiring thirty kegs, of twenty-five pounds each, of powder, in one month's time, three shifts in the twenty-four hours. The average size of the gangway was eight and one half by eleven feet. This work was done at Summit Hill colliery, No. 2.

**TABLE No. 7.**—*Shows the rates of wages paid to colliery hands in the Lehigh region during 1879, and the price realized for coal in market, &c.*

| MAMMOTH VEIN. | Basis rates | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Rates of wages paid to the following hands during the month of June, 1879. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Price of coal per ton in market, | $5 00 | $3 00 | $2 90 | $2 90 | $2 90 | $2 90 | $2 90 | $3 00 | $3 00 | $3 00 | $3 00 | $3 50 | $3 50 | |
| Rate per cent. added or deducted, | | 28 off. | 29.4 | 29.4 | 29.4 | 29.4 | 29.4 | 28 | 28 | 28 | 28 | 21 | 21 | Breaker boss, $60 00 per month.<br>Engineer, 48 60 per month.<br>Fireman, 42 12 per month.<br>Dispatchers, 50 00 per month.<br>Blacksmiths, 2 00 per day.<br>Carpenters, 1 50 per day. |
| Gangways timbered, | $6 12 | $4 40 | $4 32 | $4 32 | $4 32 | $4 32 | $4 32 | $4 40 | $4 40 | $4 40 | $4 40 | $4 84 | $4 84 | Platform men, (breaker,) $1 15 per day. |
| Gangways not timbered, | 5 35 | 3 85 | 3 78 | 3 78 | 3 78 | 3 78 | 3 78 | 3 85 | 3 85 | 3 85 | 3 85 | 4 23 | 4 23 | Chute men, (breaker,) $1 00 per day. |
| Chutes, per yard, | 2 87 | 2 07 | 2 03 | 2 03 | 2 03 | 2 03 | 2 03 | 2 07 | 2 07 | 2 07 | 2 07 | 2 27 | 2 27 | Slate pickers, (best,) 85 cents, Boys, three to six cents per hour, according to size. |
| Cross-cuts, per yard, | 1 91 | 1 38 | 1 35 | 1 35 | 1 35 | 1 35 | 1 35 | 1 38 | 1 38 | 1 38 | 1 38 | 1 51 | 1 51 | |
| Air-way, per yard, (25 square feet,) | 3 25 | 2 34 | 2 30 | 2 30 | 2 30 | 2 30 | 2 30 | 2 34 | 2 34 | 2 34 | 2 34 | 2 57 | 2 57 | |
| Opening breast, (allowance of about $15.) | | | | | | | | | | | | | | |
| Cross-holes from gangway to air-way, | 3 83 | 2 76 | 2 70 | 2 70 | 2 70 | 2 70 | 2 70 | 2 76 | 2 76 | 2 76 | 2 76 | 3 03 | 3 03 | |
| Price per two-ton cars for coal, | 85 | 61 | 60 | 60 | 60 | 60 | 60 | 61 | 61 | 61 | 61 | 67 | 67 | |
| Price per ton, (48 cubic feet,) | 42,5 | 30,6 | 30 | 30 | 20 | 30 | 30 | 30.6 | 30.6 | 30.6 | 30,6 | 33,5 | 33,5 | |
| Miners, per week, | 12 60 | 9 07 | 8 90 | 8 90 | 8 90 | 8 90 | 8 90 | 9 07 | 9 07 | 9 07 | 9 07 | 9 95 | 9 95 | |
| Miners' laborers, first class, | 10 80 | 7 78 | 7 63 | 7 63 | 7 33 | 7 63 | 7 63 | 7 78 | 7 78 | 7 78 | 7 78 | 8 53 | 8 53 | |
| Miners' laborers, second class, | 9 90 | 7 13 | 6 99 | 6 99 | 6 99 | 6 99 | 6 99 | 7 13 | 7 13 | 7 13 | 7 13 | 7 82 | 7 82 | |
| Company laborers, | 9 00 | 6 48 | 6 36 | 6 36 | 6 36 | 6 36 | 6 36 | 6 48 | 6 48 | 6 48 | 6 48 | 7 11 | 7 11 | |

The average price of coal in market, at which miners were paid at, was $3 04 per ton in 1879.

The rates of wages in this region are governed according to the price of coal in market; the basis of which is $5 00 per ton at Port Johnson or Elizabeth port. When coal deviates from this, fourteen per cent. is added or deducted for every dollar or fraction of a dollar advance or decline in the price of coal. For the year 1880 the ten per cent. sliding scale will be employed instead of the fourteen, as used heretofore.

TABLE No. 8.—*Shows the rates of wages paid to Colliery hands, during 1879, in the Wharton and Buck Mountain veins.*

| | Basis. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Price of coal per ton in market, | $5 00 | $3 00 | $2 90 | $2 90 | $2 90 | $2 90 | $2 90 | $3 00 | $3 00 | $3 00 | $3 00 | $3 50 | $3 50 |
| Rate per cent. added or deducted. | .... | 28 | 29 4/10 | 29 4/10 | 29 4/10 | 29 4/10 | 29 4/10 | 28 | 28 | 28 | 28 | 21 | 21 |
| Gangway per yard, Wharton vein, | $4 59 | $3 30 | $3 24 | $3 24 | $3 24 | $3 24 | $3 24 | $3 30 | $3 30 | $3 30 | $3 30 | $3 63 | $3 63 |
| Price per two ton car, Wharton vein, | 97 | 70 | 68½ | 68½ | 68½ | 68½ | 68½ | 70 | 70 | 70 | 70 | 77 | 77 |
| Air-ways per yard, Wharton vein, | 3 06 | 2 20 | 2 16 | 2 16 | 2 16 | 2 16 | 2 16 | 2 20 | 2 20 | 2 20 | 2 20 | 2 42 | 2 42 |
| Cross-cut per yard, Wharton vein, | 2 30 | 1 66 | 1 62 | 1 62 | 1 62 | 1 62 | 1 62 | 1 66 | 1 66 | 1 66 | 1 66 | 1 82 | 1 82 |
| Opening breast, Wharton vein, | 8 50 | 6 12 | 6 00 | 6 00 | 6 00 | 6 00 | 6 00 | 6 12 | 6 12 | 6 12 | 6 12 | 6 72 | 6 72 |
| Gangway per yard, Buck Mountain vein, | 4 55 | 3 28 | 3 21 | 3 21 | 3 21 | 3 21 | 3 21 | 3 28 | 3 28 | 3 28 | 3 28 | 3 60 | 3 60 |
| Price per 2½ ton cars, Buck Mountain vein, | 94 4/10 | 68 | 67 | 67 | 67 | 67 | 67 | 68 | 68 | 68 | 68 | 74 6/10 | 74 6/10 |
| Price per ton, Buck Mountain vein, | 45 3/10 | 32½ | 32 | 32 | 32 | 32 | 32 | 32½ | 32⅓ | 32⅓ | 32⅓ | 35 8/10 | 38 8/10 |
| Price per ton, Wharton vein, | 48½ | 35 | 34 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 35 | 38 | 38 |

Average price of coal during the year, $3 04⅙.

For the rates of day's wages, see table No. 7. The rate per cent. is the same as that employed in table No. 7. The price paid for blasting powder, is $2 60 per keg. Oil per gallon, 75 cents. Blasting paper per quire, 45 cents. Lamp wick per pound, 48 cents. Shovels, 75 to 80 cents each. Blasting tubes per foot, 5 cents. Miner's soap per pound, 6 cents. Miner's lamps, from 20 to 25 cents apiece.

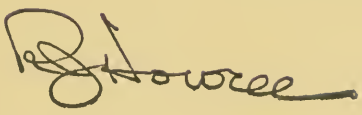
For the year 1880, ten per cent. will be employed, instead of fourteen, as used heretofore.

**TABLE No. 9.**—*Statistics pertaining to Slopes, showing their length, degree of dip, number of lifts sunk, elevation at top and bottom of each slope, vertical depth, &c.*

| Number of slopes in operation. | LOCATION. | Slope number. | Length of slope. | Average pitch. | Number of lifts sunk. | Mean Tide Elevations on | | | Direction of dip. | Name of vein worked. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Top or entrance of slope. | Bottom of slope. | Vertical depth of slope. | | | |
| | | | feet. | degrees. | | feet. | feet. | feet. | | | |
| 1 | Upper Lehigh, | 1 | 365 | 24½ | 2 | 1,807 | 1,626 | 181 | South, | B, | Down to basin. |
| 2 | do. do. | 2 | 455 | 32 | 2 | 1,787 | 1,547 | 240 | do. | B, | Down to basin, another lift to be sunk by an inside slope. |
| 3 | do. do. | 3 | 534 | 9¼ | 2 | 1,818.7 | 1,732.7 | 86 | North, | B, | do. do. do. |
| 4 | do. do. | 4 | 1,300 | 20 | 4 | 1,807 | 1,627 | 180 | do. | B, | do. do. do. |
| 5 | Woodside, | 1 | 255 | 37 | 1 | 1,854 | 1,718 | 136 | South, | B, | do. do. do. |
| 6 | do. | 2 | 320 | 35 | 2 | 1,831 | 1,699 | 132 | North, | B, | do. do. do. |
| 7 | Drifton, | 1 | 755 | 18½ | 2 | 1,617 | 1,380 | 237 | do. | B, | do. do. do. |
| 8 | do. | 2 | 451 | 28 | 2 | 1,692 | 1,480 | 212 | South, | B, | Not near to basin. Still sinking. |
| 9 | Pond Creek, | 1 | 184 | 35 | 1 | . . . . . | . . . . . | . . . . . | do. | B, | Down to basin. |
| 10 | Sandy Run, | 1 | 145 | 43 | 1 | 1,591 | 1,557 | 34 | North, | B, | do. |
| 11 | do. | 2 | 360 | 43 | 1 | 1,643 | 1,402 | 241 | do. | B, | Another lift to sink. |
| 12 | do. | 3 | 348 | 18 | 2 | 1,574 | 1,465 | 109 | do. | B, | do. do. |
| 13 | Highland, | 1 | 1,039 | 30 | 4 | 1,727.4 | 1,343.2 | 384.2 | South, | B, | Down to basin. |
| 14 | do. | 2 | 400 | 45 | 1 | 1,762.6 | 1,539.7 | 222.9 | North, | B, | Two more lifts to sink. |
| 15 | Lattimer, | 1 | 489 | 45 | 2 | 1,591 | 1,278 | 313 | do. | E, | Basin lift worked by No. 2. |
| 16 | do. | 2 | 432 | 60 | 1 | 1,589 | 1,279 | 310 | South, | E, | Down to basin. |
| 17 | Milnesville, | 6 | 294 | 35 | 1 | 1,587 | 1,470 | 117 | North, | E, | do. |
| 18 | do. | 7 | 441 | 50 | 2 | 1,576 | 1,291 | 285 | South, | E, | do. |
| 19 | Hollywood, | 1 | 242 | . . . . . | 1 | 1,567 | 1,427 | 140 | North, | E, | do. |
| 20 | do. | 2 | 289 | 45 | 1 | 1,562 | 1,343 | 219 | South, | E, | do. |
| 21 | Buck Mountain, | 2 | 270 | 35¼ | 1 | . . . . . | . . . . . | . . . . . | North, | B, | do. |
| 22 | do. | 4 | 726 | 34 | 2 | 1,673 | 1,430 | 243 | South, | B, | do. |
| 23 | do. | 6 | 300 | 40 | 1 | . . . . . | . . . . . | . . . . . | North, | B, | do. |
| 24 | do. | 7 | 300 | 35 | 1 | 1,578.7 | 1,405 | 173.7 | South, | B, | do. |
| 25 | Eckley, | 2 | 486 | 35 | 2 | 1,698.7 | 1,440 | 258.7 | North, | B, | do. |
| 26 | do. | 5 | 447 | 45 | 2 | 1,659 | 1,352 | 307 | South, | B, | do. |
| 27 | Jeddo, (Oak Dale, No. 1,) | 3 | 627 | 30 | 2 | 1,551 | 1,258 | 293 | do. | E, | do. |
| 28 | do. (Oak Dale, No. 2,) | 4 | 846 | 32 | 3 | 1,547 | 1,098 | 448 | do. | E, | do. |
| 29 | Ebervale, | 1 | 820 | 30 | 3 | 1,526 | 1,103 | 423 | do. | E, | do. |
| 30 | do. | 2 | 853 | 30 | 3 | 1,522 | 1,079 | 443 | do. | E, | do. |
| 31 | do. | 3 | 915 | . . . . . | 3 | 1,525 | 1,185 | 340 | North, | E, | do. |
| 32 | Harleigh, | 1 | 461 | 25 | 2 | 1,518.5 | 1,363 | 155.5 | South, | E & D, | do. |
| 33 | do. | 4 | 230 | 42 | 1 | 1,512.6 | . . . . . | . . . . . | North, | E & D, | do. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 34 | Gowen, | 2 | 295 | 45 | 1 | 1,114 | 872 | 242 | North, | B, Not near the basin. |
| 35 | Stockton, | 2 | 1,450 | 34 | 5 | 1,584 | 781 | 803 | South, | D & E, Another lift to sink. |
| 36 | do. | 4 | 461 | 33½ | 1 | 1,545 | 1,284 | 261 | North, | D & E, Down to basin. |
| 37 | do. | 5 | 642 | 34¼ | 2 | 1,549 | 1,190 | 359 | do. | D & E, Down to basin by an under ground slope. |
| 38 | do. | 6 | 565 | 33½ | 2 | 1,552 | 1,250 | 302 | South, | D & E, Not near the basin. |
| 39 | South Sugar Loaf, | 1 | 667 | 24 to 50 | . . . | 1,571 | 1,189 | 382 | North, | D & E, Main basin lift, worked by No. 2, S. L. |
| 40 | Sugar Loaf, | 1 | 1,615 | 32⅝ | 6 | 1,619 | 749 | 870 | South, | E, Down to basin, |
| 41 | do. | 2 | 1,188 | 33 | 5 | 1,587 | 928 | 659 | do. | D & E, Lower lift worked by No. 1. |
| 42 | Laurel Hill, | 5 | 375 | 30 to 40 | 3 | 1,588 | 1,298 | 290 | North, | E, Two lifts more to sink. |
| 43 | Hazleton Mines, | 1 | 2,236 | 10 to 45 | 8 | 1,673 | 866 | 807 | | |
| 44 | Cranberry, | 1 | 732 | 16 | 3 | 1,622 | 1,423 | 199 | South, | D & E, Down to basin. |
| 45 | Crystal Ridge, | 4 | 237 | 25 to 45 | 1 | 1,660 | 1,499 | 101 | North, | E, Two more lifts to sink. |
| 46 | do. | 6 | 387 | 3 to 29 | 1 | . . . . | . . . . | . . . . | do. | E, Down to basin. |
| 47 | Mount Pleasant, | 2 | 508 | 30 | 2 | 1,706 | 1,477 | 229 | South, | D, Another lift to sink. |
| 48 | Humboldt, | 1 | 390 | 24½ | 1 | 1,742 | 1,582 | 160 | . . . . | . . . . Down to basin. |
| | | 4 | . . | . . . | . . | . . . . | . . . . | . . . . | South, | D, |
| 49 | Stafford, (S. Wharton,,) | 2 | 350 | 45 | 2 | 1,644 | 1,399 | 245 | North, | D & E, Down to basin. |
| 50 | Coleraine, | 1 | 1,100 | 20 | 3 | 1,625.2 | 1,413.2 | 2·2 | West, | E, Old No. 2, down to basin. |
| 51 | do. | 2 | 585 | 28 | 2 | 1,616.3 | 1,320 | 296.3 | North, | D & E, New No. 2, down to basin. |
| 52 | do. (Wharton,) | 4 | 435 | 40 | 2 | 1,620.2 | 1,369.4 | 250.8 | South, | D, Down to basin. |
| 53 | Jeanesville, | 1 | 601 | 22 | 2 | 1,636 | 1,406 | 230 | do. | D & E, do. |
| 54 | do. | 4 | 566 | 31 | 1 | 1,696 | 1,413 | 283 | do. | D & E, do. |
| 55 | do. | 5 | 662 | 25 | 2 | 1,636 | 1,407 | 229 | do. | B & E, do. |
| 56 | Beaver Brook, | 2 | 780 | 10 | 3 | 1,737 | 1,612 | 125 | do. | D, Down to boundary line. |
| 57 | do. | 4 | 660 | 34⅛ | 2 | 1,744 | 1,380 | 364 | do. | D, Down to basin. |
| 58 | do. | 6 | . . . . | 30 | 2 | 1,726 | 1,532 | 194 | do. | D & E, Down to boundary line. |
| 59 | Treskow, | 6 | 600 | 21 | 3 | 1,751 | 1,536 | 215 | North, | D & E, Down to basin. |
| 60 | Yorktown, | 5 | 390 | 45 | 1 | 1,760 | 1,487 | 273 | South, | D & E, Another short lift. |
| 61 | do. | 6 | 750 | 20 | 3 | 1,750 | 1,510 | 240 | do. | D, Down to basin by an under ground slope. |
| 62 | Nesquehoning, | 3 | 258 | 40 | 1 | 1,151 | 878 | 273 | do. | E & F, Another lift to sink. |
| 63 | do. shaft, | . . . | 310 | . . . . | 1 | 1,074 | 764 | 310 | . . . . | E, do. do. |
| 64 | do. tunnel, | 2 | 1,420 | . . . . | 1 | 1,049 | . . . . | Cut the | N. dip, | F. Lower lift worked. |
| 65 | Lansford, | 4 | 679 | 69 | 3 | 1,302 | 665 | 637 | North, | E, Not near the basin. |
| 66 | do. | 7 | 570 | 69 | 2 | 1,464 | 930 | 534 | do. | F, do. |
| 67 | do. tunnel, | 6 | 950 | 45 | 1 | 1,072 | . . . . | . . . . | South, | E & F, do. |
| 68 | do. do. | 9 | 2,260 | 42 | 1 | 980 | . . . . | . . . . | North, | E, do. |

| | |
|---|---|
| Number of inside slopes in operation, | 13 |
| Number of drifts in operation, | 3 |
| Number of slopes, from surface, in operation, | 63 |
| Number of tunnels in operation, | 6 |
| Number of shafts in operation, | 1 |
| | — |
| Total in operation, | 89 |
| | — |

| | |
|---|---|
| Number of slopes abandoned, about 50. | |
| Hazelton borough, at Pardee's Corner, | 1,614.50 above tide. |
| Jeanesville store step, | 1,665.40 do. |
| Audenried, | 1,700 do. |
| Summit Hill, town, | 1,509 do. |
| Mauch Chunk borough, | 532 do. |

E—Mammoth vein. D—Wharton vein. B—Buck Mountain vein.